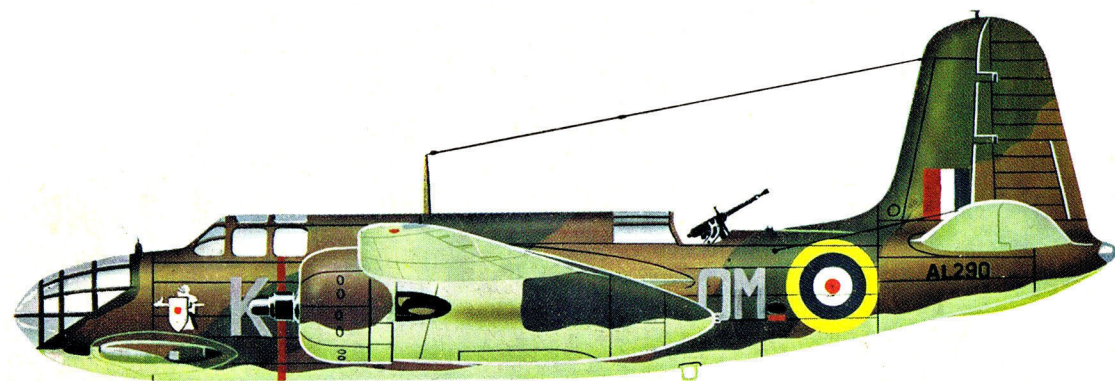


BOMBERS



ROYAL AIR FORCE

BOMBERS

OF WORLD WAR TWO

VOLUME ONE

by Philip J. R. Moyes
illustrated by James Goulding

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Foreword

At no time has the interest in aircraft of World War Two been as great as it is today. Already many books have been published in this country on the main combat planes of the period, Allied and Enemy alike, and scale-model aircraft kits are equally numerous. Yet the enthusiasts everywhere seem to be demanding more information on this absorbing subject every day.

The most frequent plea is for information about the operational histories of World War Two aircraft rather than merely their development histories, because the latter have, in many cases, already been adequately recorded. Coupled with this is an ever-increasing demand for colour illustrations of the subjects described—and indications are that this requirement is by no means confined to modellers, for many non-‘kit bashers’ apparently derive great pleasure from seeing famous aircraft of yesteryear recreated by a skilful artist.

It is in an attempt to meet these two present-day requirements that this series of books, *Men and Machines*, is being produced, the present volume being the first of three which will collectively cover all the R.A.F. bomber aircraft of World War Two. Other volumes will deal with R.A.F. fighters of the same period and also the wartime aircraft of the other major powers.

Much of the information in this series is completely new, and all of it—whether it be narrative or artwork—is fully authenticated. This first volume describes five separate types of aircraft, ranging from the single-engined Fairey Battle, ill-starred campaigner with the Advanced Air Striking Force in France in 1940, to the mighty four-engined Lancaster, ‘Bomber’ Harris’s chief instrument of victory in the awesome night bombing offensive which helped bring Hitler’s vaunted ‘1,000-year Reich’ to its knees.

In keeping with the theme *Men and Machines*, the main emphasis is on action, and in an attempt to capture something of the atmosphere of bomber operations many of the photographs portray aircraft and crews preparing for, or actually in, action. Similarly the fact that many of the machines featured in the artwork bear obvious signs of use is intentional, for again the theme is to stress the truly operational side of the subject. We repeat that all the paintings are firmly based on fact, and furthermore we are confident that not only the basic aircraft themselves but also the details of their ‘powder and paint’ are unsurpassed for accuracy. Now turn the pages and judge for yourself.

London, 1968

PHILIP J. R. MOYES

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Avro Manchester

In the latter half of 1936 the Air Ministry outlined its requirements for a new generation of big bombers. The Handley Page Heyford and Vickers Virginia biplanes were still the mainstay of the R.A.F.'s night-bomber force at that time, and although the Whitley had begun to enter service and the Handley Page Hampden and the Vickers Wellington were coming along, the Air Ministry already wanted something better.

Two specifications were issued: B.12/36, which called for a four-engined heavy bomber; and P.13/36, which called for a twin-engined medium bomber, though this latter was to be considerably heavier and larger than the Whitley, Hampden, or Wellington, all of which were then regarded as heavies. Of the several tenders received to Specification P.13/36, two were selected for construction, namely the Avro 679, which became the Manchester, and the Handley Page H.P.56; both types made use of the new and then untried Rolls-Royce Vulture engine, and orders were placed for two prototypes of each. The H.P.56 was abandoned in 1937 in favour of a four-Merlin version, later built in quantity as the H.P.57 Halifax. This left the field clear to the Manchester, and in July 1937 A. V. Roe received a contract for 200 production aircraft, 'straight off the drawing-board', to Specification 19/37.

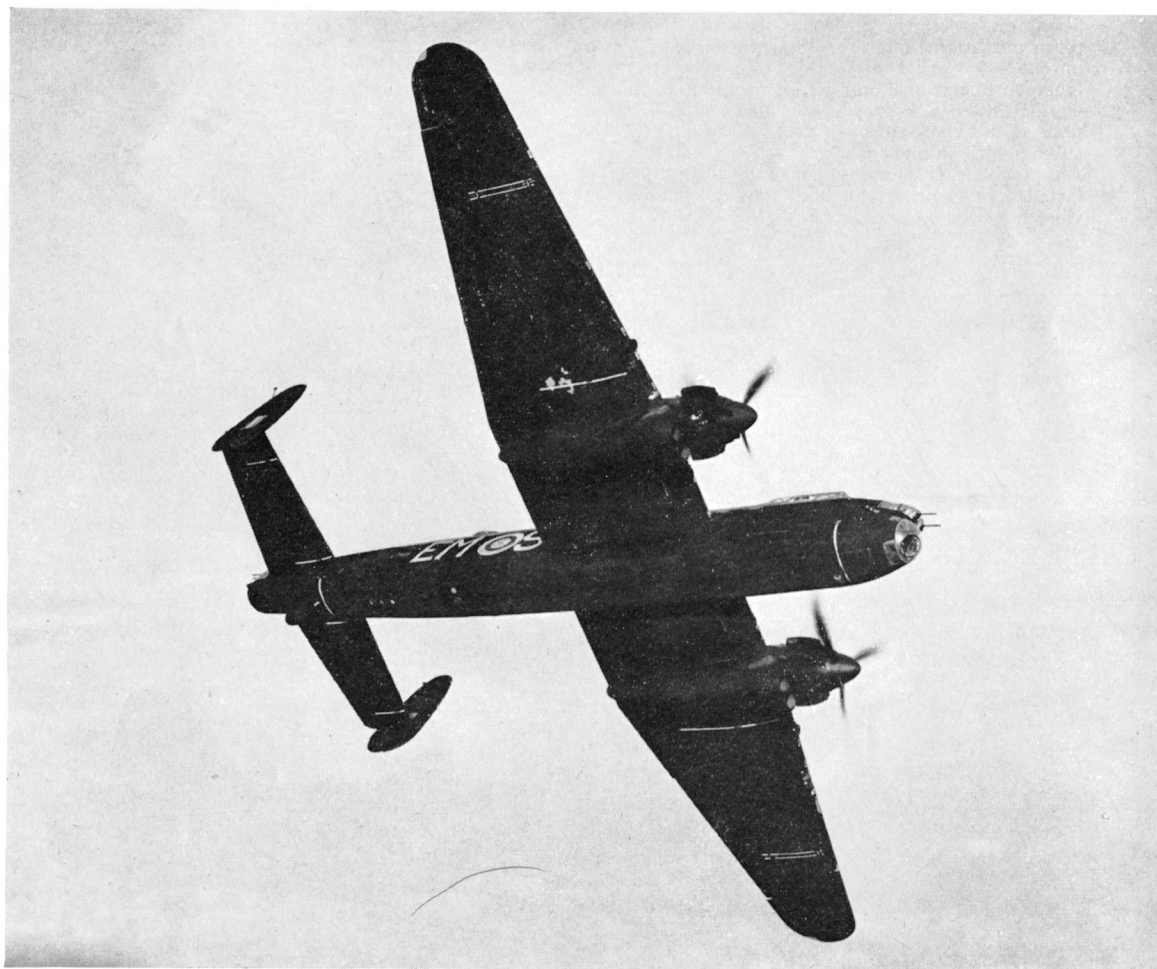
As originally conceived the Manchester had twin fins and rudders inboard on the tailplane, but the first prototype (L7246) emerged with twin fins and rudders outboard. This machine first flew on July 25 1939, and following tests at the Aeroplane and Armament Experimental Establishment at Boscombe Down, it was given an additional central fin. The second prototype (L7247) flew early in 1940; it too had a centre fin and furthermore was the first Manchester to have armament installed. Eventually it was fitted with new wing-tips which extended the span by 10 ft. to give a 90-ft. span. Production proceeded apace—Metropolitan Vickers also being awarded a contract to build the bomber in 1939—and early in November 1940 some of the 'first off' reached 207 Squadron,

newly re-formed at Waddington (Lincs.) in 5 Group, Bomber Command.

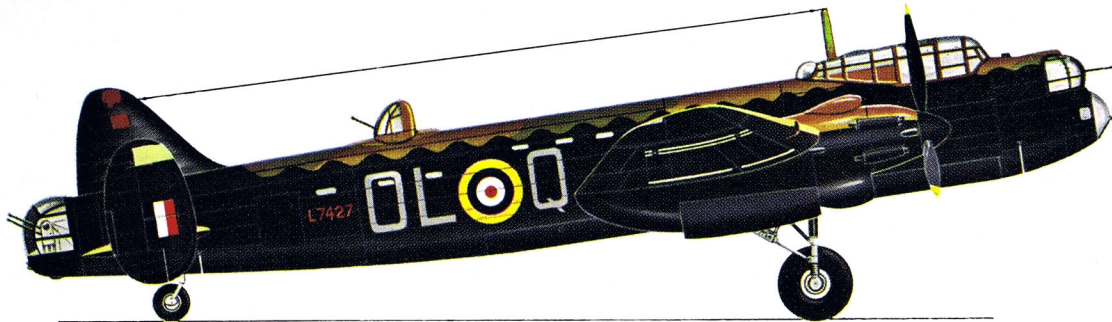
Unfortunately, the Manchester's career was dogged by a spate of troubles right from the start. Numerous modifications to both airframe and engines were found to be necessary as a result of A. & A.E.E. testing, and in addition to these and other Service problems, production lagged due to shortage of high-pressure couplings and other small but essential items. Matters were not improved when, on December 23, the

Luftwaffe bombed the Metrovick works at Trafford Park, Manchester, destroying the company's newly completed first production Manchester (first flown three days previously) together with twelve more Manchesters which were following on.

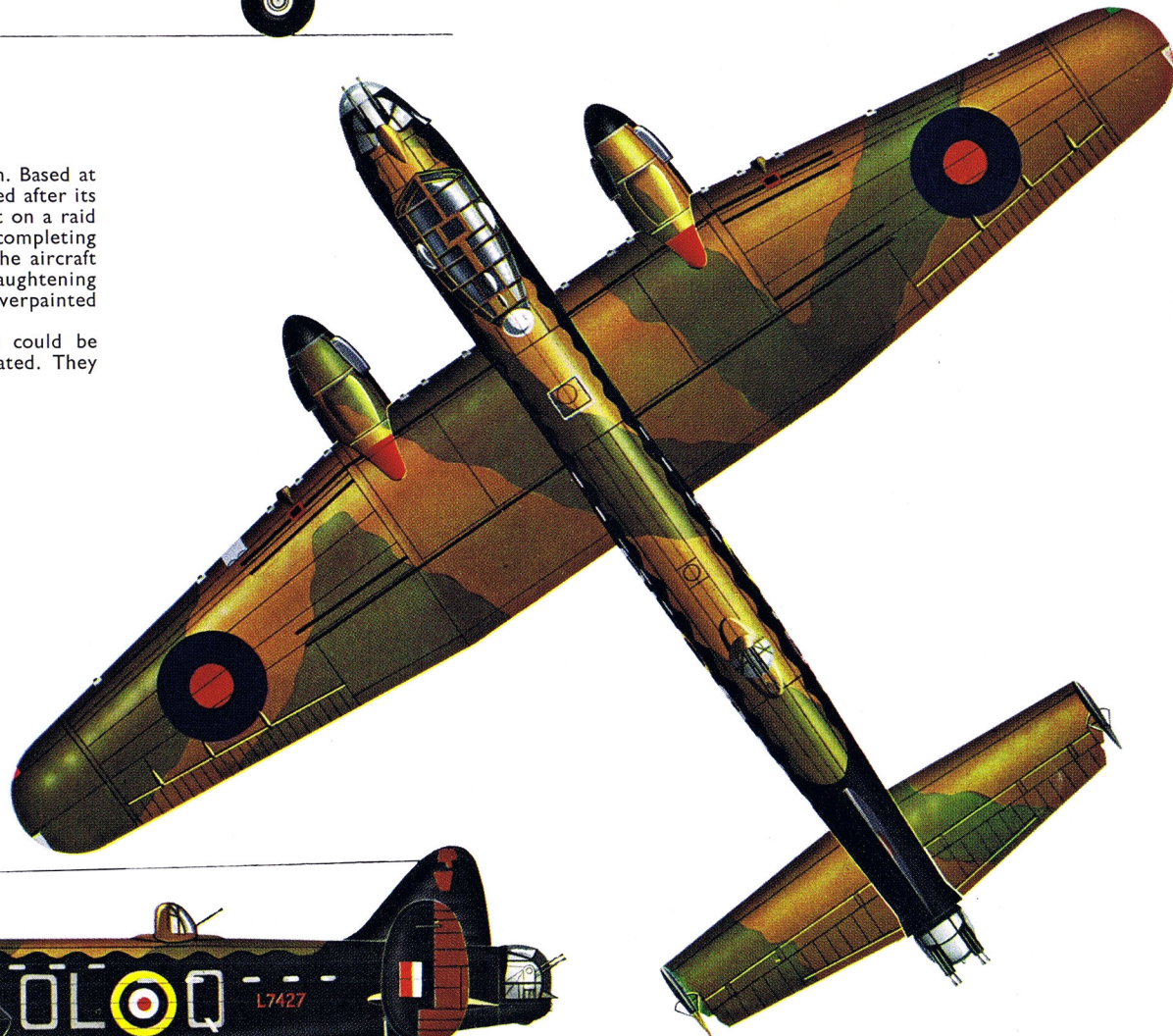
Not until the night of February 24–25 did 207 Squadron's Manchesters begin operations, and then only six were serviceable for a raid on a *Hipper*-class cruiser at Brest. All completed the mission, although L7284 crashed on landing back at Waddington, due to failure of the hydraulic system and the incorrect assembly of the emergency air system preventing one leg of the undercarriage from locking down; fortunately none of the crew was injured. In this first raid the Manchesters dropped a total of seventy 500 lb. S.A.P.

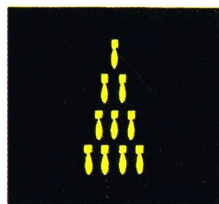
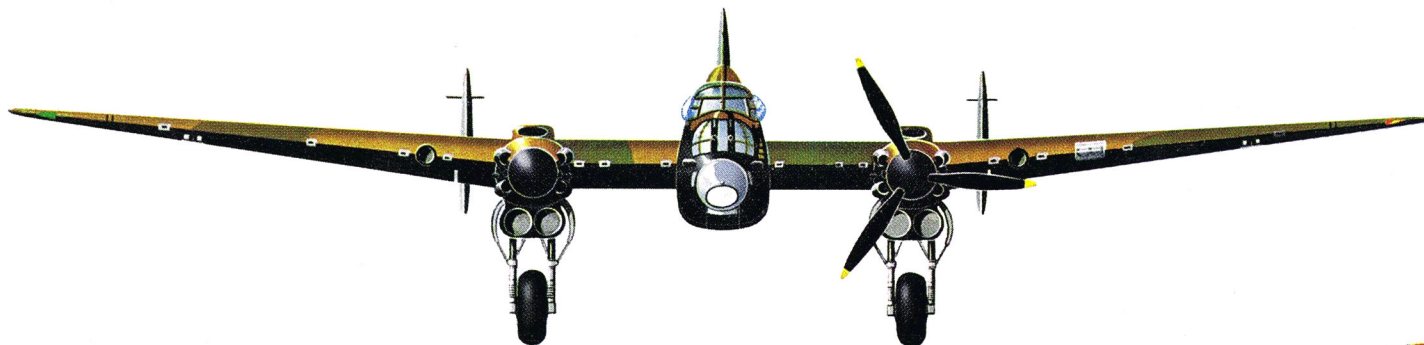


*Manchester IA L7515 of 207 Squadron, Waddington (Lincs.), being put through its paces early in November 1941 by a pilot who, in the previous month, earned a D.S.O. for bringing a Manchester back from Berlin on one engine. The white lines painted on the aircraft indicated the appropriate positions for joists and other lifting tackle. [*Flight International*].*

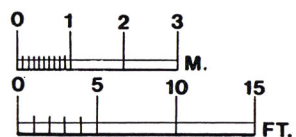


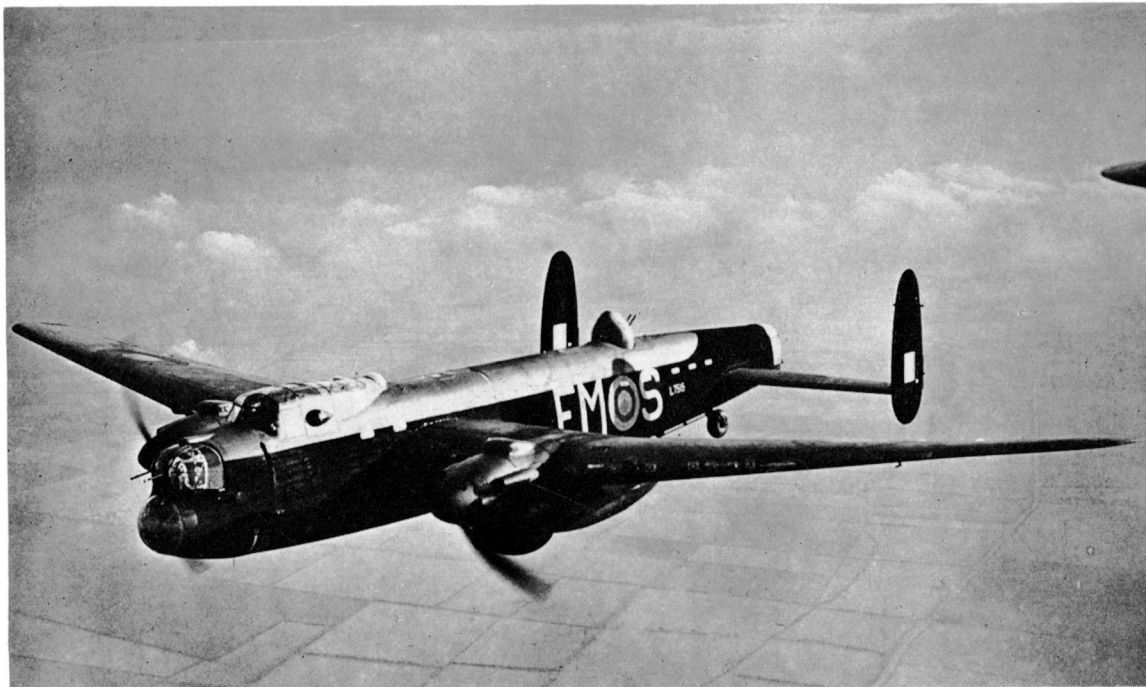
Avro Manchester I, L7427, of No. 83 (B) Squadron. Based at Scampton, Lincs., this aircraft is shown as it existed after its tenth operational flight. L7427 was eventually lost on a raid on the 8-9 April 1942, against Hamburg, after completing fourteen operational sorties. Repaired areas on the aircraft were painted with grey primer and red fabric taughtening dope at this time, although they may have been overpainted subsequently in night black. Although either a mid-upper or ventral turret could be installed in Manchesters, both have been illustrated. They were not used on one aircraft.





Operational sortie score
on the nose of the aircraft.





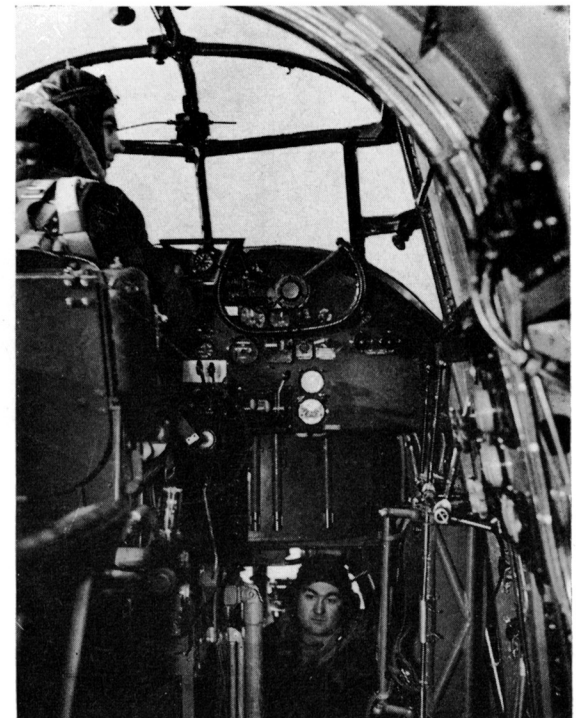
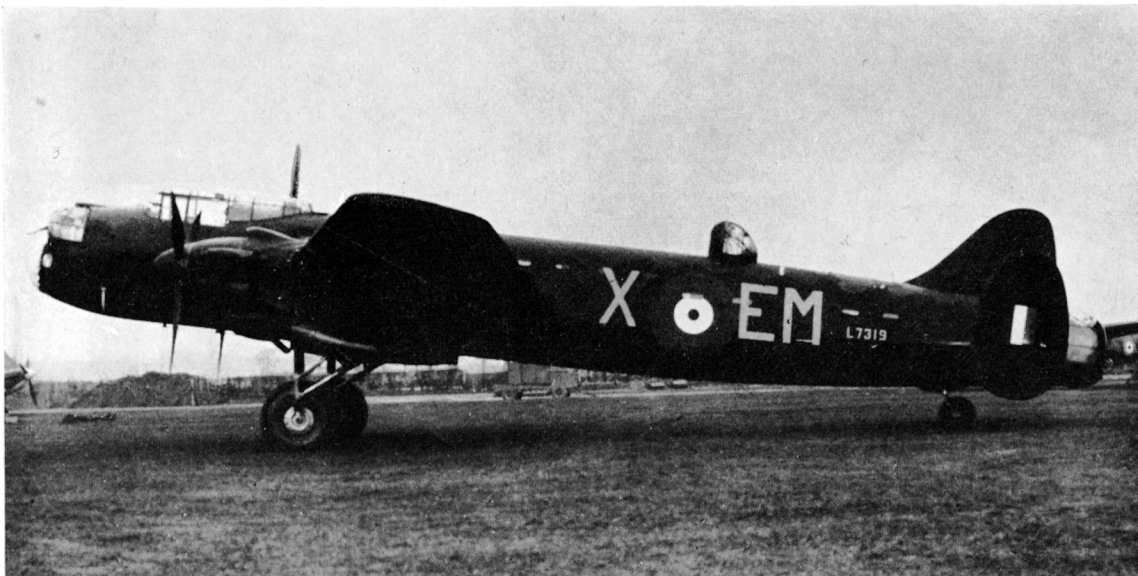
Another view of Mk. IA L7515. ['Flight International']

(steel armour piercing) bombs in the target area, but no results were observed, as the aircrafts' transparent noses did not allow the bomb-aimers an adequate field of vision. The outcome of this was modification action to incorporate a new transparent panel.

Eventually seven squadrons of 5 Group came to be equipped with the Manchester; but although some of them persevered with it until mid-1942 its unserviceability was such that it was frequently grounded for several weeks at a time, and on one or two occasions squadrons had to recommence operations with Hampdens. Mechanical troubles of one sort or another were never absent, and during both operations and training sorties many accidents occurred—often with tragic results. Engine bearings seized, propellers feathered unaccountably, and tail flutter was encountered when climbing with full load. The latter was soon remedied, if not completely cured, but although

Pilot's cockpit of a Manchester with the bomb-aimer coming up from his station in the nose.

Below: Manchester I L7319 of 207 Squadron pictured at the Air Fighting Development Unit, Duxford (Cams.), to which it was attached for fighter affiliation. Rather ironically, perhaps, this machine was shot down by a German intruder one night in March 1942, five miles from Waddington. This photograph was taken on orthochromatic film, which accounts for the unusual appearance of the fuselage roundel. Note how the black paint has been extended from its original position of half-way up the fuselage and given a wavy edge at the top.





The wireless-operator (left of picture) seen with the navigator, who sat on the other side of the half-partition with his back to the pilot.

View aft down the fuselage showing a member of the crew at the flare chute.



various other problems were eventually overcome too, the basic problem of unreliable power plant stubbornly remained. The Vulture engines, under-powered and over-heating, were unable to lift it above the critical flak level, and on one engine it quickly lost height. All things considered, it was one of the R.A.F.'s greatest disappointments, and not surprisingly production was terminated when only 200 Service aircraft had been delivered—157 by Avro and the rest by Metrovick.

A 106 Squadron pilot summed the Manchester up pretty accurately when he told bomber ace Guy Gibson, on the latter's arrival at Coningsby in March 1942 to take command of the squadron: 'These Manchesters. They're awful. The actual kite's all right



Mk. IA L7483 'O-Orange' and crew of 207 Squadron, Waddington, November 1941. The Mk. IA—the twenty-first and subsequent aircraft—differed from the Mk. I in having the tailplane increased in span from 28 ft. to 33 ft., larger fins and rudders and the centre fin deleted. Note the balloon-cable cutters in the leading edge of the wing.

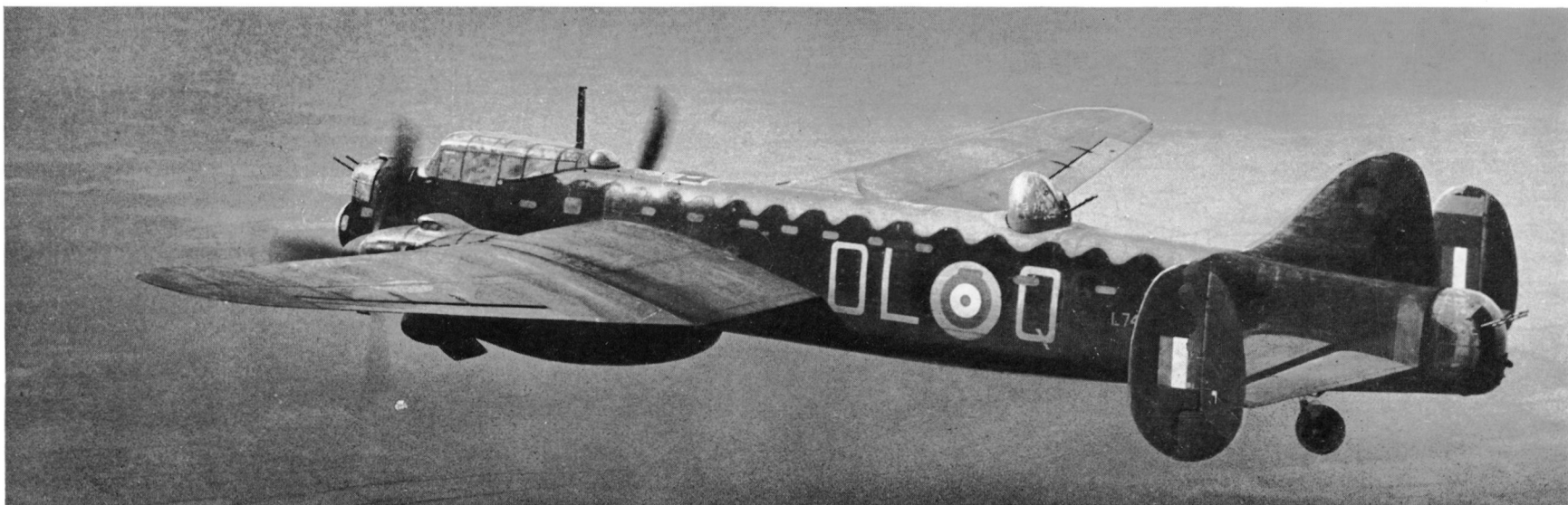
but it's the engine. They're fine when they keep turning but they don't often do so.' Nevertheless 106 Squadron did manage to set a record with Manchesters by despatching eight—the most ever sent out by one squadron on operations—for sea-mining on May 3–4 1942. Incidentally, two of them were the only Bomber Command aircraft lost that night.

With an engine out of action the Manchester was usually as good as lost, although occasionally pilots did manage to coax them back home. One such pilot, F/O (later S/Ldr) H. G. Hazelden, of 83 Squadron, whilst over Hamburg on the night of April 8–9 1942, had an engine hit by flak. The engine failed on the return trip but he managed to maintain height at 4,800 ft., and flew for one and a half hours on one engine, landing his Manchester (L7484) safely at Horsham St. Faith. For many years since the war 'Hazel', as he is known among the flying fraternity, was chief test pilot of Handley Page Ltd.

Early in August 1941 a Manchester of 207 Squadron—L7432 'Z-Zebra' (P/O 'Kipper' Herring)—was lucky enough to get back all the way from Berlin on one

engine. At 18,000 ft. over the target the port engine was hit by flak and all the coolant lost, and Herring had no alternative but to cut the engine and feather the propeller. Avoiding-action was taken as the crippled bomber limped back towards England, flying at only 5,000 ft. through the searchlight belt. The aircraft was icing up and losing height, and in an attempt to reach home all auxiliary equipment—including the dinghy—was jettisoned. After what must have seemed an age to the crew, a safe landing was made at an airfield in Norfolk despite one tyre having been shot through.

Less fortunate than either Hazelden or Herring was nineteen-year-old Sgt Wilkie, captain of 50 Squadron Manchester L7456, detailed for the famous '1,000-bomber' raid against Cologne on May 30–31 1942. On the way out, his machine, despite the application of extra boost, stubbornly refused to gain the required height; but Wilkie nevertheless pressed on and eventually found himself approaching the target at 9,000 ft. It was then that fate took a hand and ended his hopes of completing the mission. He was suddenly coned by three searchlights, and while endeavouring to



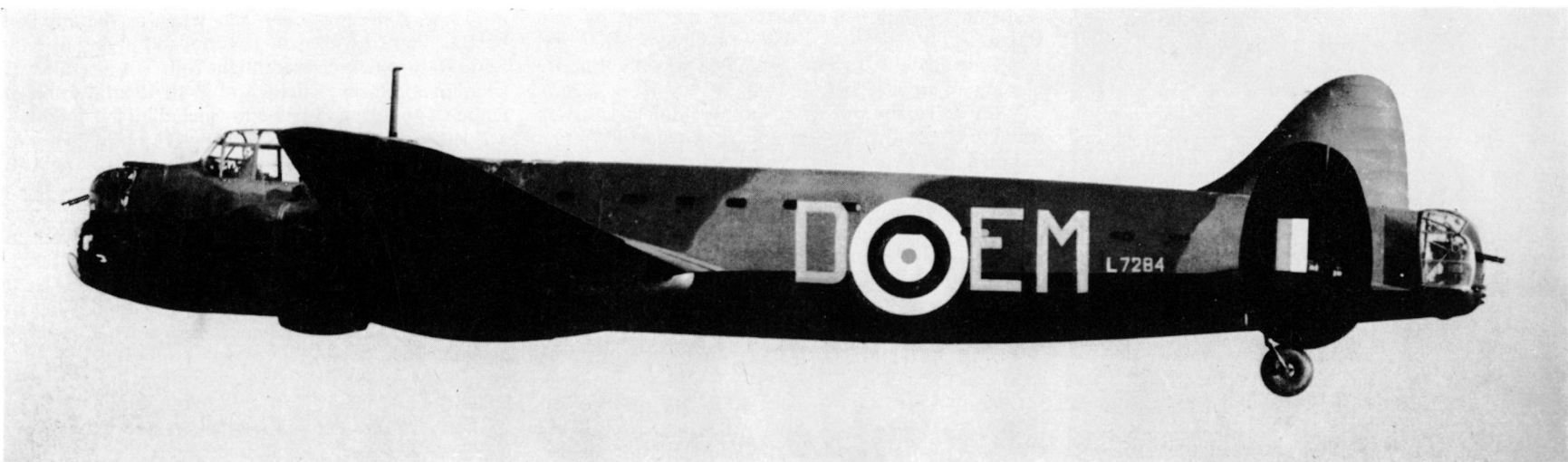
escape from their clutches his port engine was badly damaged—apparently by flak—and set on fire. He cut the engine and jettisoned the bomb-load, but as the aircraft was rapidly losing height he ordered the crew to bale out. Then, knowing it was too late for him to do likewise, he switched on the landing lights to see what was beneath him, brushed some trees, and then, quite involuntarily, made a perfect belly landing on what was, as it turned out, the airfield at Düsseldorf. He was unhurt and was made a prisoner almost immediately.

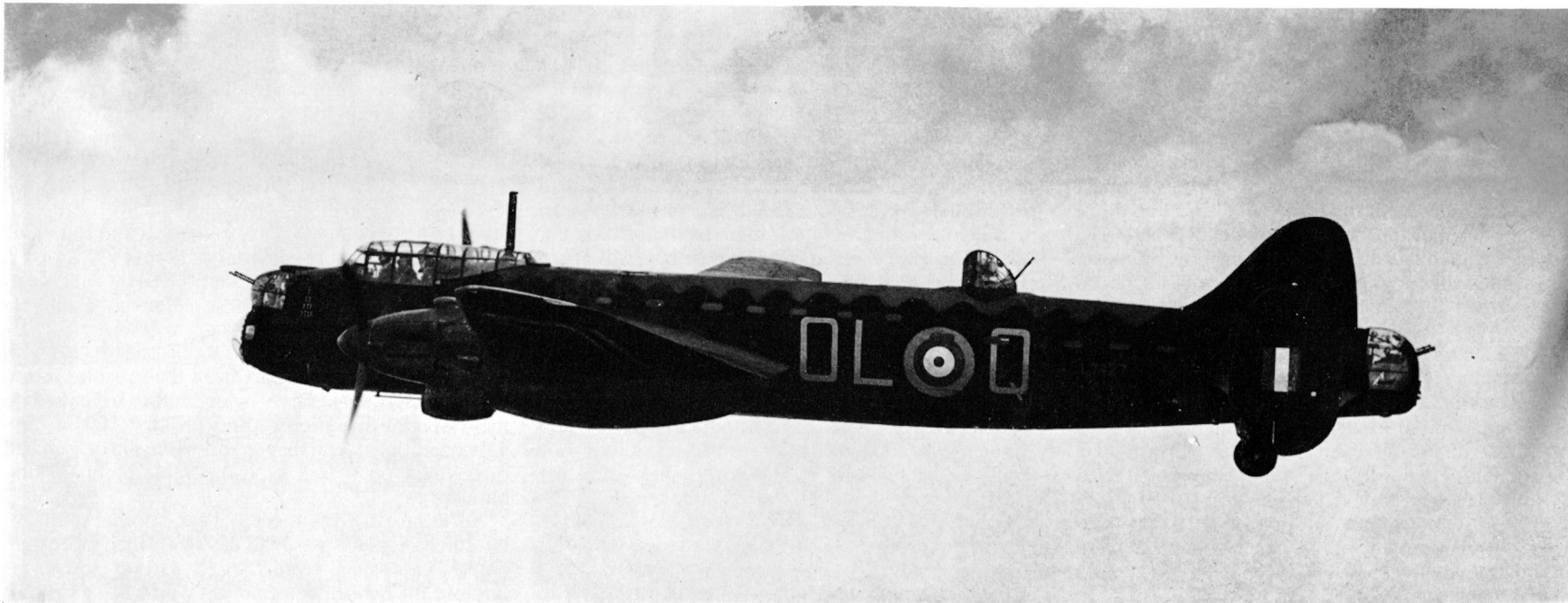
Above and facing page: 83 Squadron's Manchester 1 L7427, the subject of the five-view colour painting on pages 6 and 7.

Engine trouble in another aircraft of 50 Squadron that night resulted in the chain of events which led to F/O L. T. Manser being posthumously awarded the V.C.—the only one won by a crew member of a Manchester. Manser was captain of Manchester

Mk. I L7284 'D-Dog' of 207 Squadron photographed in 1941. This machine later went to 61 Squadron and was struck off charge in June 1943. [Imperial War Museum.

L7301, and although the bomber had behaved satisfactorily on air-test, fully loaded its ceiling was no more than 7,000 ft. All attempts to gain more height overheated the engines. Manser was facing exactly the same hazards as Sgt Wilkie. He, too, decided against turning back. As the aircraft was approaching the target, an hour later, it was caught by searchlights and subjected to intense and accurate flak. Manser held the Manchester straight and level and bombed the target. Almost immediately afterwards the aircraft received a direct hit from a flak shell and Manser took





Trolley load of 2,000-pounders arrives at an 83 Squadron Manchester I's dispersal site at Scampton (Lincs.), March 1942.



violent evasive action. He now ran into a hail of light 20-millimetre flak and the searchlights were shining through the cockpit roof. The bomber was down to 800 ft. before it finally escaped into the darkness. The rear-gunner had been wounded, the rear part of the bomb doors had been blown off, and the bomber was now dangerously low. Manser began to climb on extra boost but as he did so the port engine overheated, and by the time he had climbed to 2,000 ft. it burst into flames.

The engine was cut and the extinguisher put into action, but the blaze continued, and it seemed that the fuel-tanks would explode in a matter of seconds. Manser, however, decided to wait and see if the fire would go out, although the instinct of the crew was to get out immediately. Within a few minutes the fire did go out but the Manchester was still losing height, and after some equipment had been jettisoned, but to no avail, Manser ordered the crew to bale out. A sergeant brought him a parachute but he thrust him away, telling the N.C.O. to jump at once as he could only hold the aircraft steady for a few seconds more. As the others descended to safety they saw the Manchester, still carrying their gallant captain, plunge to earth and burst into flames.

A few weeks after the first 1,000-bomber raid, the Manchester flew its final operational mission with

Bomber Command. The date and occasion were June 25–26 and the third 1,000-bomber raid, when the target was Bremen. The Manchesters were part of a mixed force (with Lancasters) despatched by 49, 50, 61, and 106 Squadrons. After this the ill-starred bomber continued in service for a time with Conversion Units, and in August 1944 it was declared obsolete.

During its service with Bomber Command the Manchester flew a total of 1,269 operational sorties, comprising 983 on bombing raids, 221 on sea-mining, and sixty-five on 'other operations'. It dropped 1,826 tons of bombs (tonnage of mines is not known) and, in the course of its operations, sixty-three aircraft were reported missing; a further thirteen aircraft were destroyed or damaged—three of them due to enemy action.

Specification

Crew 7; *power plant* two 1,760 h.p. Rolls-Royce Vulture; *span* 90 ft. 1 in.; *length* 68 ft. 10 in.; *wing area* 1,131 sq. ft.; *empty weight* 29,432 lb.; *loaded weight* 56,000 lb.; *max. bomb load* 10,350 lb.; *max. speed* 264 m.p.h. at 17,000 ft.; *service ceiling* 19,200 ft.; *range* 1,200 miles with max. bomb load, 1,630 miles with 8,100 lb. bomb load; *armament* twin .303 in. m.g. in nose and dorsal, and four .303 in. m.g. in tail turret.

Avro Lancaster

In the summer of 1940, when the Manchester was still in the development stage, it became obvious to those closely connected with the project that there could be no guarantee that the troubles then being experienced with its twin Rolls-Royce Vulture engines would ever be satisfactorily overcome. In an attempt to find a hasty remedy for a possible disaster, Roy Chadwick and his A. V. Roe design team modified the basically sound Manchester airframe to take four of the rugged Merlin engines which had already proven themselves in the Hurricane, Spitfire, and Whitley. With typical ingenuity, a standard Manchester airframe was given a new wing with increased rib spacing to make the span 100 ft., and fitted with four underslung 1,145 h.p. Merlin X engines. Serialled BT308 and provisionally known as the Manchester III, this prototype first flew at Woodford on January 9 1941. Thus was born, out of a failure, the immortal Lancaster, supreme British heavy bomber of World War II, and one of the most successful aircraft of all time.

Flight tests with BT308 exceeded expectations—it did 307 m.p.h. at a loaded weight of 50,000 lb.—and as a result it was decided to switch production at Avro and Metropolitan Vickers from Manchesters to Lancasters after the 200th Manchester had left the production-line. A second prototype (DG595) flew in May 1941 and production models followed, using the Manchester airframes already under construction. The first production Lancaster (L7527) flew in October 1941, and in common with other early production Mk. Is, it was powered by Merlin XX engines of around 1,280 h.p. each. Later Mk. Is had Merlin XXIIIs and XXIVs, each of 1,280 h.p., the latter being fitted with paddle-bladed propellers which resulted in improved performance at take-off and at high altitude—and also gave rise to the nickname of ‘Paddle-Steamer’ bestowed by the crews who flew the aircraft.

First Lancaster squadron was No. 44 (Rhodesia) Squadron, based at Waddington (Lincs.), in No. 5 Group of Bomber Command. In September 1941 the squadron (which was then flying Hampdens) received the first Lancaster prototype for training purposes, and on Christmas Eve it received three production machines. Others soon followed, and on March 3

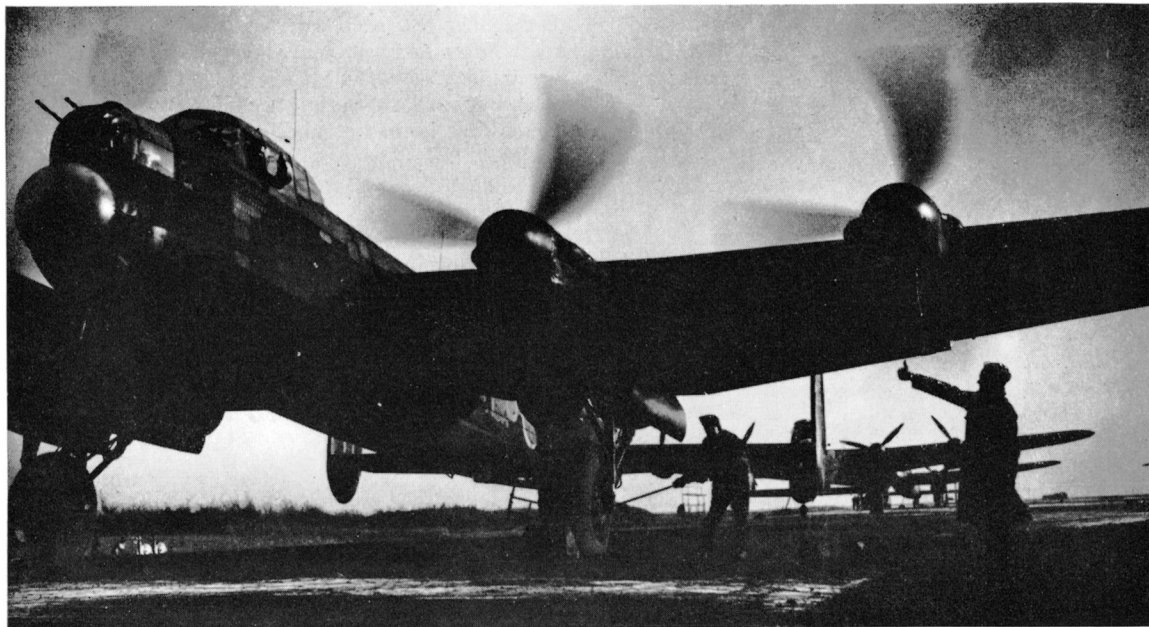
four Lancasters and crews, including S/Ldr J. D. Nettleton, one of the flight commanders, were detailed for the first operation—mine laying or *gardening* in the Heligoland Bight. At 6.15 p.m. Nettleton took off, followed by the others at three-minute intervals. They returned between four and five hours later, having planted their *vegetables* in the allotted areas, meeting with little opposition from flak. A week later, on March 10–11, Lancasters flew their first bombing mission when two from No. 44 were detailed to join a mixed force of fifty bombers attacking Essen. Both Lancasters carried 5,040 lb. of incendiaries apiece, and although both completed their sorties successfully, one (L7536) suffered slight damage from flak—the first Lancaster to be blooded.

Meanwhile deliveries were increasing and 97 Squadron had also begun to re-equip with Lancasters. The type made what might be termed its public debut—for it was then that it was first announced on the radio and in the Press—on April 17 1942, when two formations from 44 and 97 Squadrons, numbering twelve Lancasters in all, thundered at tree-top level across

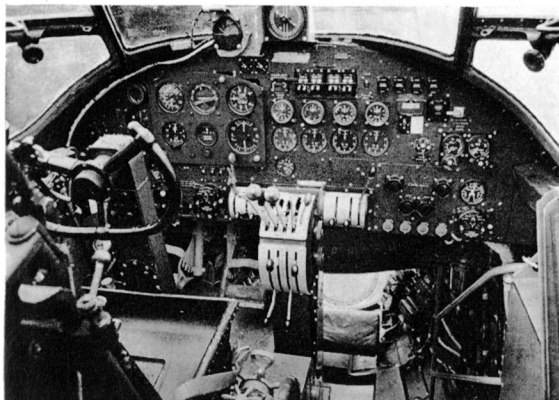
enemy territory to bomb the great MAN diesel-engine factory at Augsburg in Bavaria. Flying in paired ‘Vics’ of three they were engaged by twenty to thirty Bf. 109s over France. Four of the leading formation were shot down, but the remainder carried on, despite formidable opposition from anti-aircraft fire, to attack their objective successfully with delayed-action bombs. Three more were lost after they had dropped their load, but the remaining five, all damaged, returned, among them being S/Ldr Nettleton’s aircraft, sole survivor out of his original formation of six. For his part in this operation Nettleton received the first of ten Victoria Crosses to be awarded to Lancaster aircrew in World War II.

From this time onwards ‘Lancaster’ became a household name, and, apart from their regular job of bombing German industry by night, they were used on many special operations, although, in so far as daylight operations went, they were never again despatched in daylight on a task of comparable ambition and hazard.

Nevertheless, on October 17 1942, another spectacular raid took place, partly in daylight, when more than ninety Lancasters from No. 5 Group squadrons bombed the Schneider armament works at Le Creusot or—in a few cases—the associated transformer and switching station at Montchanin. The raid involved up to ten hours’ flying, and only one aircraft was lost.



Pilot of a Lancaster ready for ops. gets the ‘all-clear’ signal as the mighty bomber’s wheel-chocks are pulled away.



Cockpit of a Lancaster B.I. At the bottom right the bomb-aimer's station can be seen up front in the nose.

Exactly a week later Italy received its first daylight raid of the war when seventy-four Lancasters, many of them carrying 4,000-lb. bombs ('cookies'), attacked Milan, causing tremendous havoc. Still another attack delivered by day-flying Lancasters was made in July 1942 on Danzig in Poland—although some of the bombers arrived after dark. The target—the submarine building yards—was not damaged, but neighbouring buildings were hit and considerable damage caused to the town. Involving a round trip of 1,750 miles, this operation compared favourably, for distance flown, with the longest bomber operations of the war, and it was remarkable that only two of the forty-odd Lancasters taking part were missing.

By the early summer of 1943, the year which brought the beginning of real devastation to industrial Germany, the Lancaster I had been joined in service by two other versions. These were the Mk. II, the only version to have radial engines, initially Bristol Hercules VI but Hercules XVI in the majority; and the Mk. III, which was visually identical to the Mk. I but had American (Packard)-built Merlin engines.

The Lancaster II was produced as an insurance against any interruption in supplies of Merlins. Two prototypes were ordered from Avro but only one (DT810) was completed, and this first flew on December 21 1941. Production of the Lancaster II was entrusted to Sir W. G. Armstrong Whitworth at Baginton (Coventry), and at an early stage of produc-

tion a Frazer Nash F.N.64 ventral turret became a standard fitment on the aircraft, as did also enlarged bomb-doors to permit the carriage of 8,000-lb. bombs.

First unit to operate the Lancaster II was 61 Squadron at Syerston (Notts.), which, in the winter of 1942–3, received about ten Mk. IIs to supplement its Mk. Is. Two initial sorties by Mk. IIs on the night of January 11–12 1943, proved abortive, but on 16–17 January the type went into action against Berlin. No. 61's Lancaster flight was soon withdrawn, but in the spring of 1943 No. 115 Squadron, based at East

Wretham (Norfolk) in 3 Group and formerly flying Wellingtons, became the first homogeneous Lancaster II squadron. This squadron received its first Lancaster IIs in March and first used the type operationally on the night of March 20–21. Three squadrons of No. 6 (R.C.A.F.) Bomber Group—Nos. 426 'Thunderbird', 408 'Goose', and 432 'Leaside', based in Yorkshire—

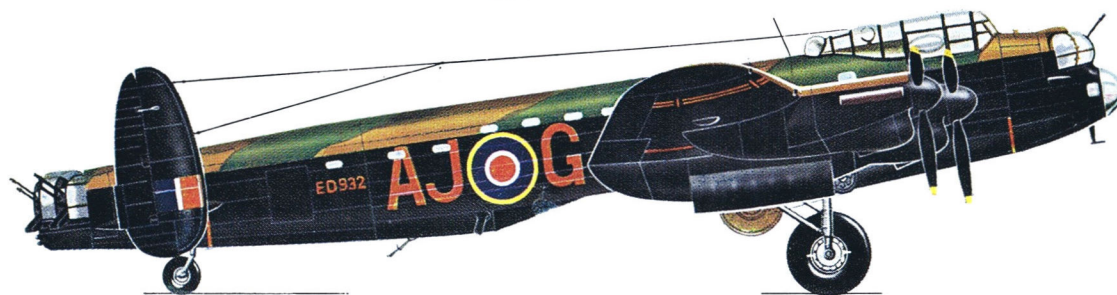
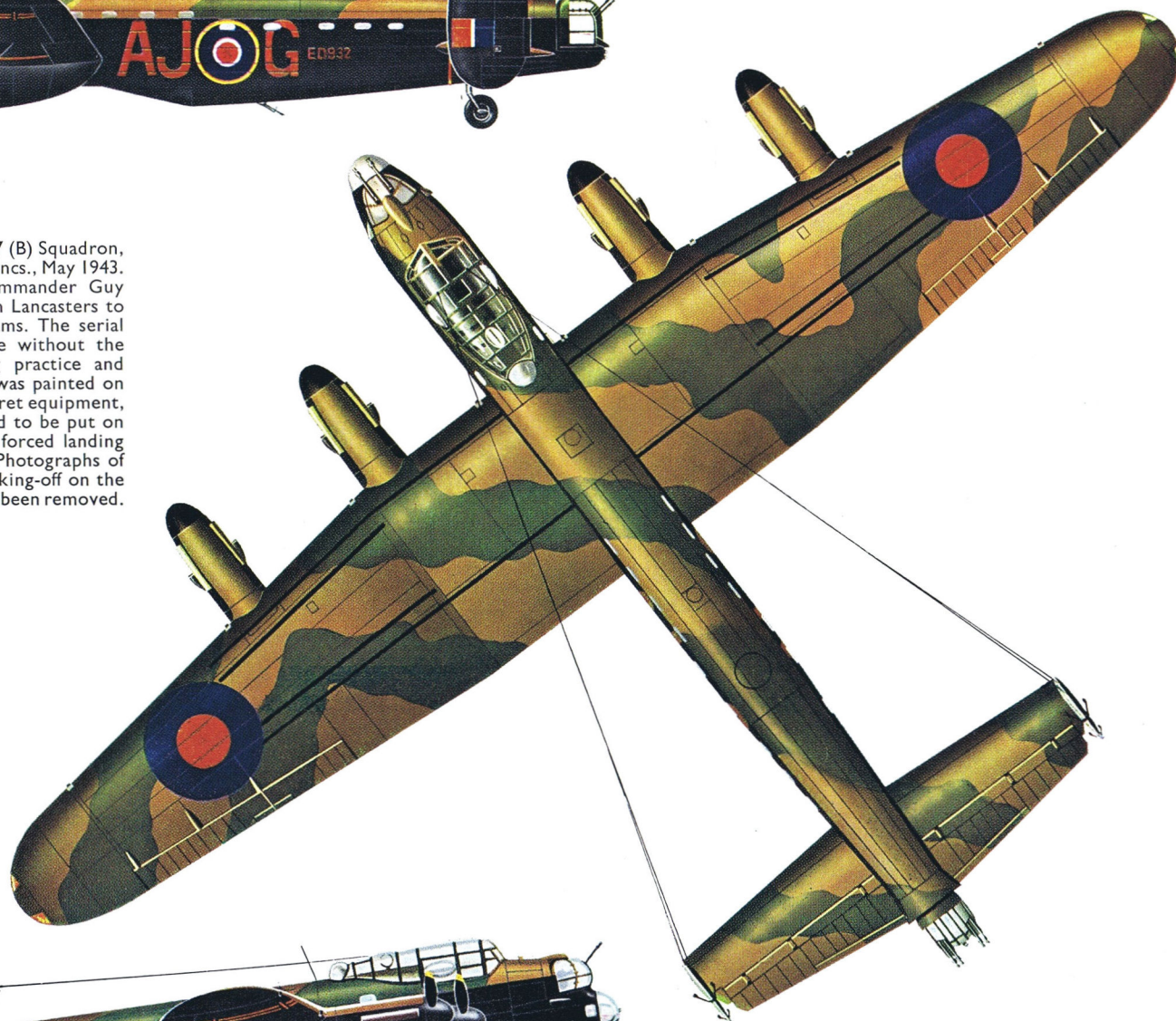
Pastoral scene—believed to be at Bottesford (Leics.) in 1942—featuring Lancaster I R5507 'Zebra-bar' of 207 Squadron. [Imperial War Museum.]

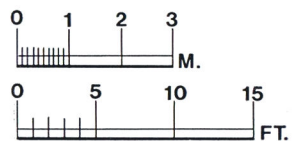
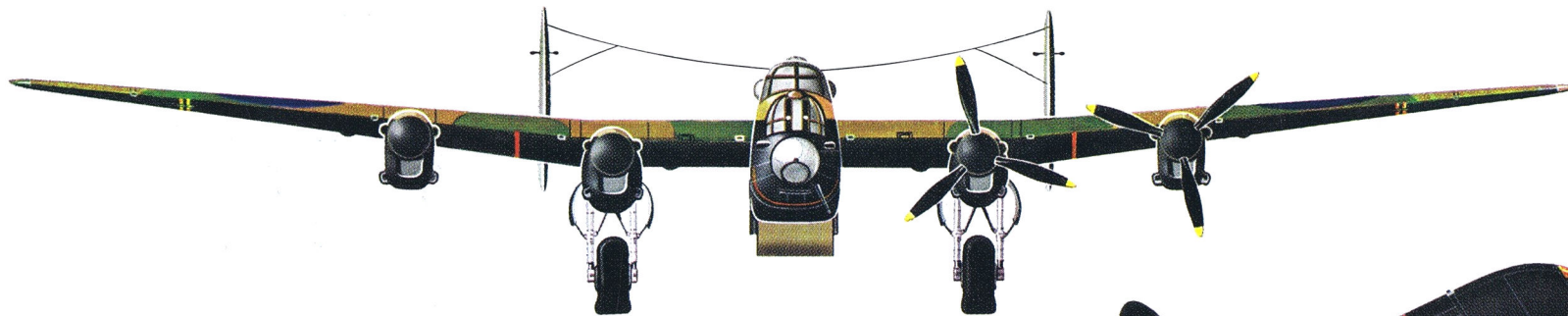


Mark I L7578 of 44 Squadron in 1942. It was in another Lancaster I 'B-Baker' of this unit (R5508) that S/Ldr J. D. Nettleton led the famous daylight raid by 44 and 97 Squadrons on the MAN Diesel engine and armaments factory at Augsburg, on April 17 1942—the mission which earned him the V.C.



Avro Lancaster B.III, ED932, of No. 617 (B) Squadron, 'The Dambusters', based at Scampton, Lincs., May 1943. This aircraft was flown by Wing Commander Guy Gibson when he led a force of nineteen Lancasters to attack the Möhne, Eder, and Sorpe dams. The serial number of the aircraft is shown here without the suffix '/G' which was carried during practice and training flights prior to the raid. This was painted on all secret aircraft or aircraft carrying secret equipment, and indicated that a guard was required to be put on the aircraft in the event of a crash or forced landing away from a security-controlled area. Photographs of the crew entering ED932 just before taking-off on the dams raid indicate that the suffix '/G' had been removed.







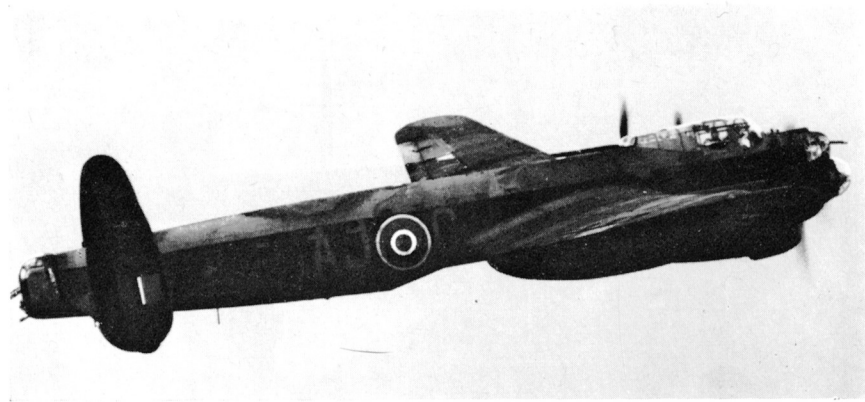
Mk. I R5689 'N-Nuts' of 50 Squadron, Swinderby (Lincs.), photographed circa August 1942 and destroyed in a crash at Thurlby while returning from a mine-laying sortie on September 18–19 1942. ['Aeroplane'*].*

began to operate Lancaster IIs before the end of 1943, and in 3 Group the newly formed 514 Squadron also received the Hercules-powered 'Lancs.'. A total of 300 production Lancaster IIs was built—all by Armstrong Whitworth—the last one being delivered in March 1944.

Deliveries to the squadrons of the Packard Merlin-powered Lancaster III began at the end of 1942 and production continued until after the war. The number of Mk. IIIs delivered as such by the contractors—Avro (Manchester Area and Yeadon), Armstrong Whitworth, and Metropolitan Vickers—totalled 3,039 (for comparison, ex-works total of Lancaster Is was 3,425); but there were some conversions in service of Mk. IIIs to Mk. Is and vice versa. The transformation from one mark to another resulted merely from engine changes, usually on major overhaul, and records show that some Lancasters flew with a mixture of British and American Merlins and in effect became hybrids!

The first Lancaster to fly with Packard Merlins was R5849, a Mk. I which, after delivery to Rolls-Royce in April 1942, was initially used for British Merlin XX development. American Merlin 28s were installed in this aircraft on August 15 1942, for intensive development work, and this led to another Mk. I, W4114, being similarly fitted in August 1942 for A. & A.E.E. trials at Boscombe Down. This second test-bed was

On July 17 1942, the crew of this Lancaster I, R5724 'J-Jig' of 61 Squadron, became the first crew in Bomber Command to bring back irrefutable evidence that they had destroyed a U-boat at sea, when they returned to St. Eval (Cornwall) with a photograph showing the U-boat crew in the water swimming away from their sinking vessel. 61 Squadron was temporarily attached to Coastal Command at that time.

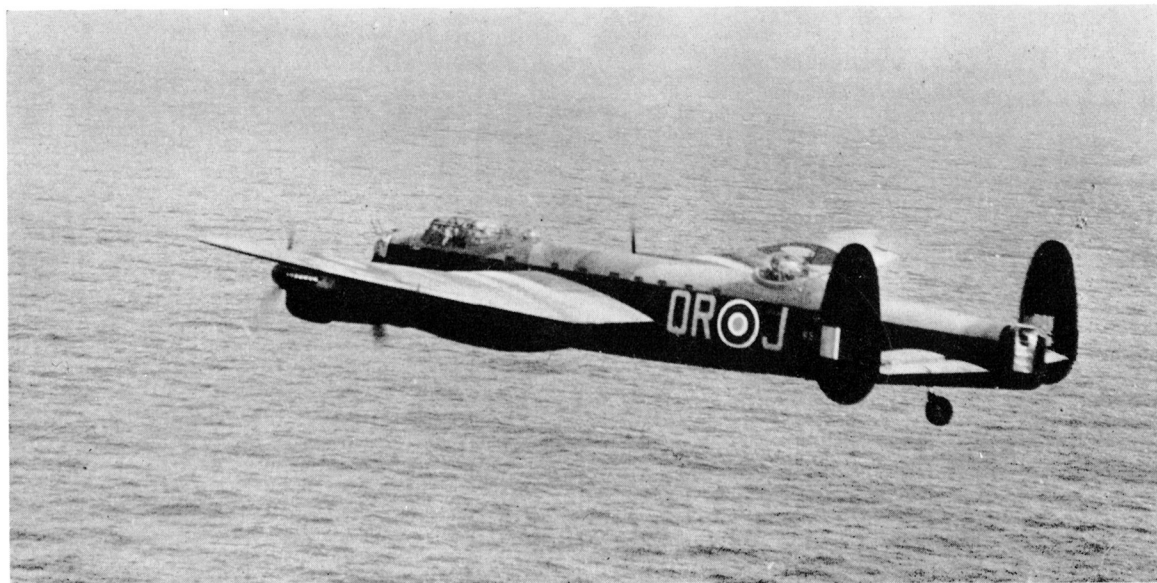


ED817 (with 'G-for-Guard' suffix deleted), second prototype B.III 'dam-buster' Special seen during a test flight. This Lancaster did not take part in the famous dams raid but another 'C-Charlie' did—ED910, flown by P/O Ottley, one of the eight aircraft which failed to return.

redesignated as the official Lancaster III prototype. Production Lancaster IIIs used Packard-built Merlin 28s, with which coolant difficulties were experienced, and Packard Merlin 38s or 224s, both of which were right up to Rolls-Royce standards.

Lancaster IIIs began to reach the squadrons in December 1942, and thereafter those squadrons that had hitherto flown Mk. Is operated Mk. Is and IIIs side-by-side. Likewise the Heavy Conversion Units and Lancaster Finishing Schools flew both marks simultaneously; but as the Packard Merlins tended to overheat quicker than the Rolls Merlins, the H.C.U.s, whose training syllabi included successive take-offs and landings, preferred Mk. Is.

Of all the Lancasters' exploits none is more famous than the raid on the Möhne, Eder and Sorpe dams, prime sources of hydro-electric power for the industry-packed Ruhr Valley, by Lancaster IIIs of 617 Squadron on the night of May 16–17 1943. Specially modified Lancasters were the only aircraft able to carry the ingenious 'bouncing bomb' designed by Dr. Barnes Wallis of Vickers-Armstrongs specifically for this





Two boys on a blockbuster. Aircrew members of the R.C.A.F.'s 426 'Thunderbird' Squadron, perched on an 8,000-lb. bomb, pose for the photographer beneath the gaping maw of their Lancaster II at Linton-on-Ouse (Yorks).

*'Goose' Squadron Lancaster II DS723 'B-Baker' tucks in its wheels as it gets airborne at Linton-on-Ouse (Yorks) in late 1943. This machine failed to return from a raid against Berlin on the night of 26-27 November 1943. [*Aeroplane*].*

operation. No other aircraft on operations has carried a weapon like it. Actually a cylindrical mine resembling a garden-roller, the weapon, because of an induced backspin, would skim across the surface of the water when released under predetermined conditions of speed and height, coming to rest against the dam wall. In this way the elaborate anti-bomb and torpedo devices were foiled.

For Operation *Chastise*, as the dams raid was code-named, 617 Squadron put up nineteen Lancasters with 133 men, and history has recorded how the Möhne and Eder dams were breached and the Sorpe damaged at a cost of eight aircraft (two others failed to reach their target and returned to base). W/Cdr Guy Gibson, C.O. of 617 Squadron, received the Victoria Cross for his gallantry on this raid, and thirty-two other members of the squadron were also decorated. This hazardous and daring raid has been hailed officially as 'the most precise bombing attack ever delivered and a feat of arms which has never been excelled'. Ever since the raid, 617 Squadron has been popularly known as the 'Dam Busters'.

On August 17-18 1943, soon after the so-called Battle of Hamburg in which it reduced that city to ruins, Bomber Command struck at the German V-weapons experimental centre at Peenemünde, and once again caused severe damage. Acting as master bomber in this epic attack was G/Capt J. H. Searby,

C.O. of 83 (Pathfinder) Squadron, flying in Lancaster III JA928 'W-William'. Despite the fact that enemy night-fighters were much in evidence, he remained over the target throughout the attack, instructing the main force by means of radio telephone. The raid was doubly notable as being the first occasion when the master bomber technique (pioneered by Guy Gibson in the dams raid) had been applied to a major attack, and the first occasion upon which Bomber Command's famous 'red spot fire' marker-bomb was operationally used.

For the R.C.A.F. 'Thunderbird' Squadron the Peenemünde attack was its first operational mission with Lancaster IIs. The squadron put up nine aircraft for the mission and one, with the C.O., W/Cdr L. Crooks, failed to return. Five nights later, when Bomber Command struck at Leverkusen, 'Thunderbird' Lancasters had the honour of being the first R.C.A.F. aircraft to drop 8,000-lb. bombs.

On November 3-4 when Bomber Command sent 589 aircraft to Düsseldorf there were, in the force, thirty-eight Lancaster IIs of 3 and 6 Groups which had been equipped with the new blind-bombing radar aid known as *G-H*. Mosquitoes fitted with *G-H* had already operated over Germany but this was the first time that the device had been used by heavies in a major raid. The crews of the *G-H* Lancasters were detailed to attack the Mannesman Steel Works which



Even training sorties held their share of hazards, as was the case with this unlucky Lancaster III, NE179 '6F-B' of 1669 H.C.U. (ex 'FL-Y' of 635 Squadron), which apparently iced up while flying in cloud, got out of control, and spun-in near Drem, Scotland, in February 1945.

lay in the northern outskirts of Düsseldorf. Five aborted, two failed to return, sixteen suffered *G-H* failure and joined the main force's area attack, while the remaining fifteen attacked their special target according to plan. Although very little damage was done to the factory, the performance of *G-H* was seen to be most promising and the raid marked another important stage in the development of precision bombing techniques. No. 3 Group became *G-H* specialists later in the war, and among their main achievements with the blind-bombing aid was a sustained all-weather attack, in July and August 1944, on Hitler's flying-bomb sites in Northern France.

The winter of 1943-4 saw the heavies embroiled in the Battle of Berlin, and into this campaign, on November 26-27 went the R.C.A.F.'s 'Leasides', making their first Lancaster II sorties. It was the third raid of the current series on 'the Big City', and in the two months or so that followed the 'Leasides' hit Berlin nine more times. Judging by the experiences of two 'Leaside' crews during that period, it seems that the enemy, in an effort to save his capital and homeland, was experimenting with something radically new in the way of night-fighter tactics. On the way out over Holland on January 2-3, Lancaster DS788 'E-Easy' (pilot, P/O Tom Spink) was attacked head-on and



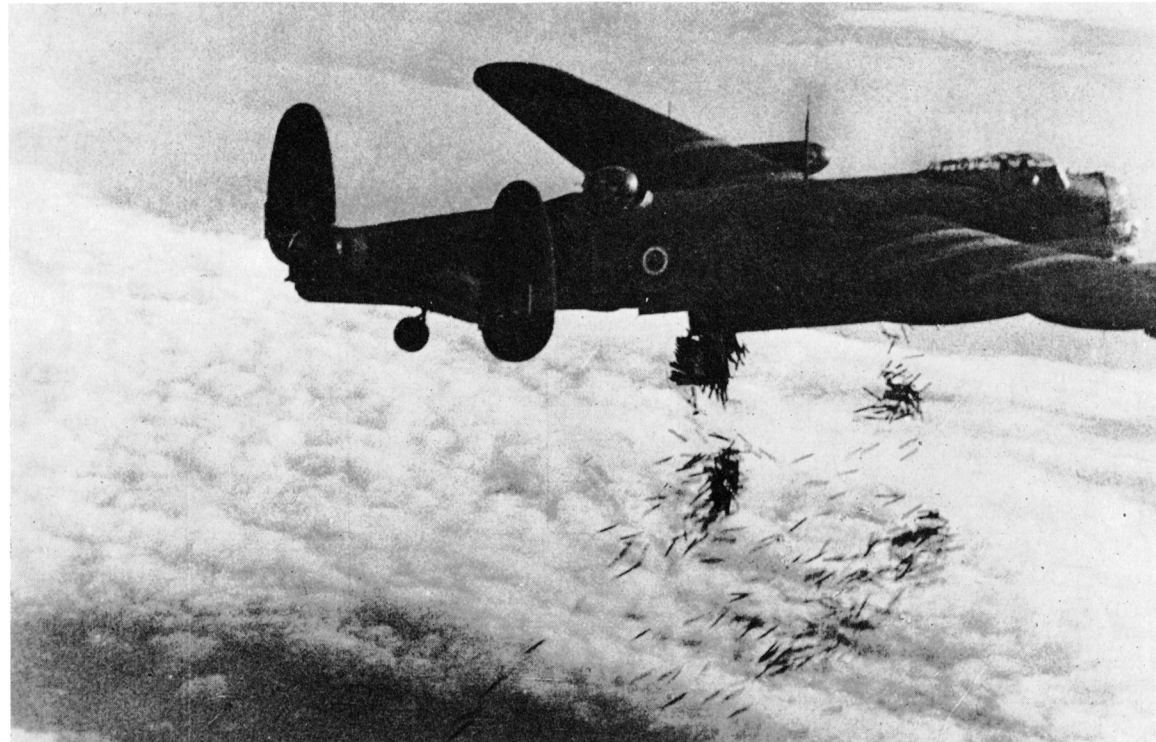
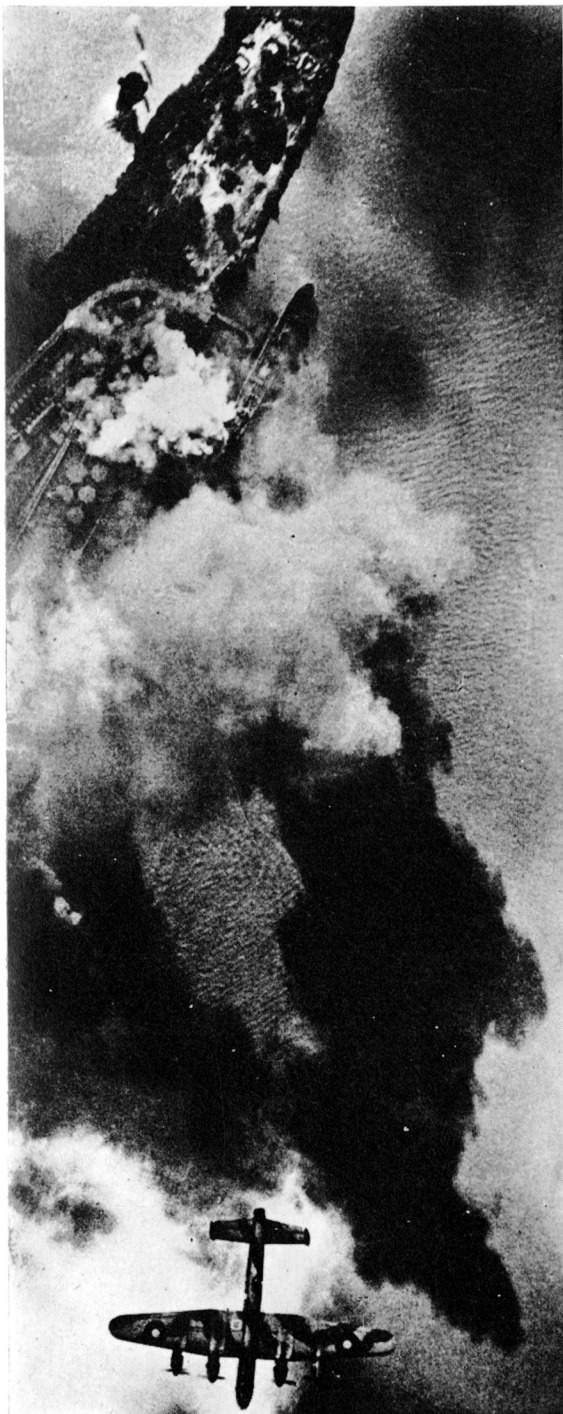
considerably damaged by, of all things, a Focke-Wulf Kurier; while in a later raid 'B-Baker' got back to base after having being similarly jumped and badly mauled by a Focke-Wulf Condor, peacetime antecedent of the Kurier. Spink and his navigator both put up a particularly good show in the above-mentioned Berlin

mission and were each rewarded with the D.F.C. Another 'Leaside' pilot who earned a D.F.C. with a cool, heady bit of flying on the same operation, was P/O J. McIntosh. The following are excerpts from this pilot's report of what transpired aboard DS792 'U-Uncle' shortly after 'bombs away'.

Just after we turned for home . . . the rear gunner (Sgt L. Bandle) spotted an Me.110. The enemy and my two gunners opened fire at the same instant. Cannon-shells hit our aircraft like sledge-hammers. The gunners scored hits on the Me.'s port engine and cockpit, and the fighter went down, burning fiercely. All this happened within five seconds. Meanwhile my control column had slammed forward (the elevator had been hit), putting the aircraft into a near-vertical dive. . . . By putting both feet on the instrument panel, one arm around the control column, and the other hand on the elevator trim, then hauling back with every ounce of strength while trimming fully nose up, I managed to pull out of the dive at about 10,000 ft. (13,000 ft. below bombing height). My compasses were unserviceable, the rudder controls had jammed, and I could get



'Goose' Squadron Lancaster II DS708 'Q-Queenie', the subject of the five-view colour painting on page 20. After the war this machine became a test-bed for the Bristol Brabazon's servo spring-tab controls.



Showery of incendiaries leave the bomb-bay of NG128 'SR-B', a B.Mk. I of 101 Squadron, Ludford Magna (Lincs.) during the great daylight raid on Duisburg by more than 1,000 R.A.F. heavies on October 14 1944. This machine, like most others of the squadron at that time, was fitted with the radio-jamming device known as Airborne Cigar, as indicated by the two dorsal radio masts. [Imperial War Museum.

very little response from the elevators. I still had to wrap both arms around the control column to maintain height. . . .

'We were now far behind the rest of the bombers, and our only hope was to stay in the cloud-tops and take our chances with the severe icing we were encountering. Fighter flares kept dropping all around us and the flak positions *en route* were bursting their stuff at our height, but the fighters couldn't see us in that cloud. . . . My navigator took astro fixes and kept us away as much as possible

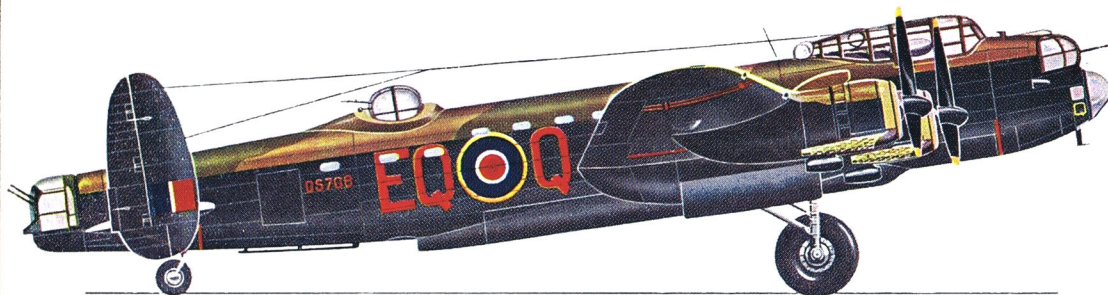
Scene during an attack by Lancasters on oil-storage depots at Pauillac and Bec d'Ambes, in the estuary of the Gironde, just north of Bordeaux, in the early evening of August 4 1944. The target-area is seen to be well on fire as bombs burst among the oil storage tanks.

from defended areas. . . . We had been losing a lot of fuel from the starboard inner tank, but enough remained to take us to Woodbridge. . . .

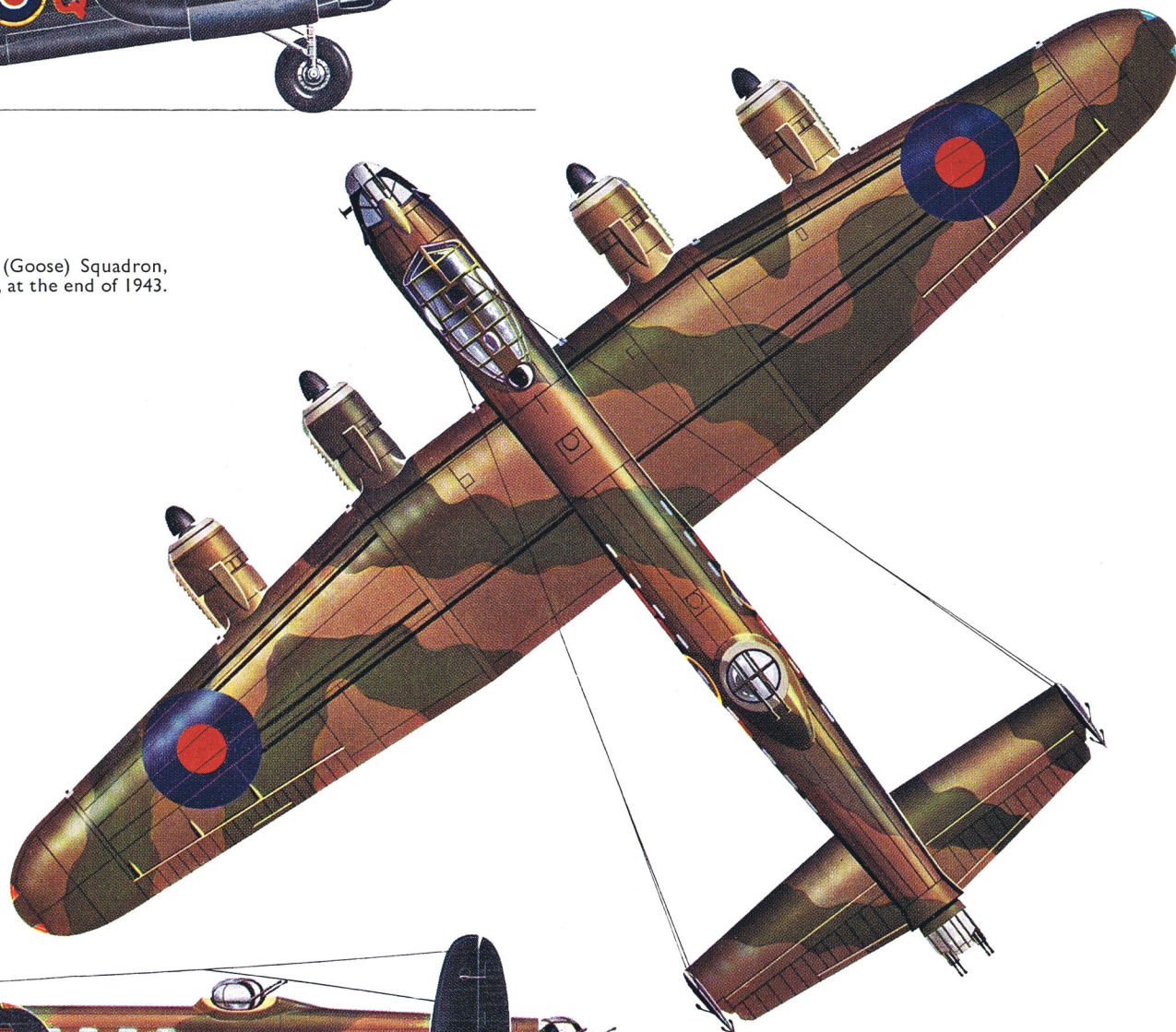
'About seventy miles out to sea I let down through cloud, experiencing severe icing, then levelled off when I broke through. . . . The aircraft was now becoming very sluggish, and only with difficulty was I able to hold height. I detailed the crew to throw out all our unnecessary equipment and to chop out everything they could. This considerably lightened the aircraft and made it easier to control. I then ordered the crew to stand by for ditching, just in case. . . . The navigator headed me straight for Woodbridge, on *Gee*. . . .

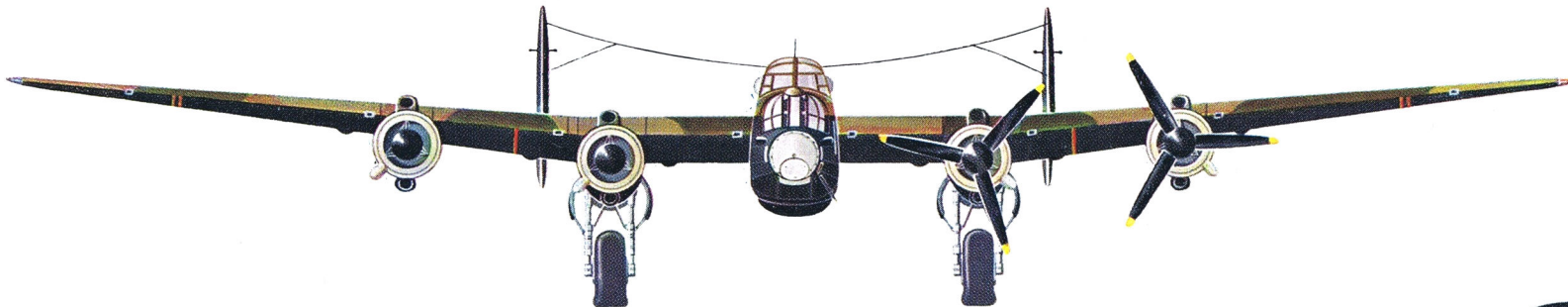
'I used all the runway and felt the kite touch down on our port wheel. . . . It rolled along until the speed dropped to about 30 m.p.h., then settled down more on the side of the starboard wheel, did half a ground-loop, and stopped. . . . I shut down the engines, got out, and took a look.

'Both starboard engine nacelles were gone; the hydraulics were smashed and twisted; two large tears were in the starboard wing near the dinghy

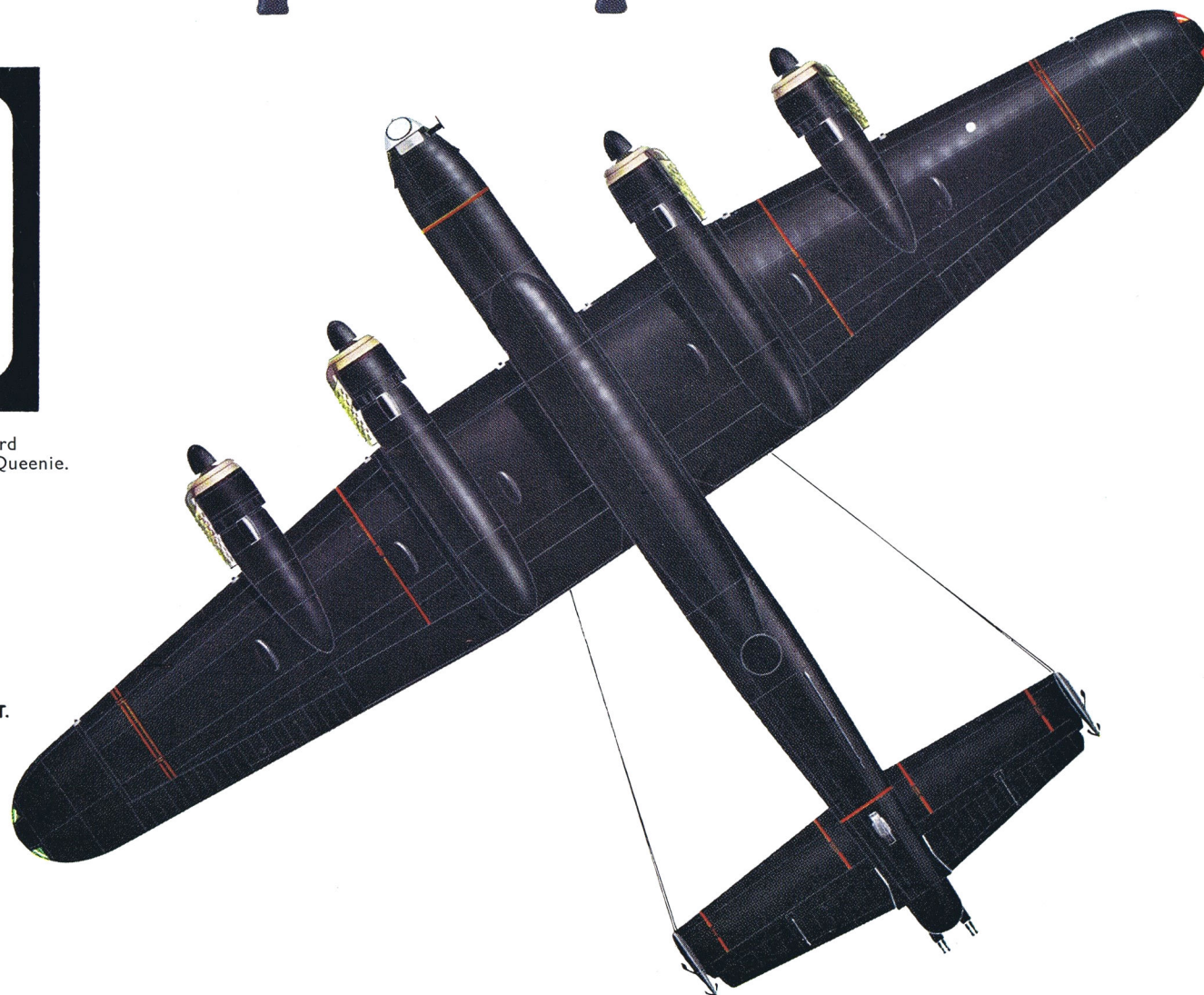
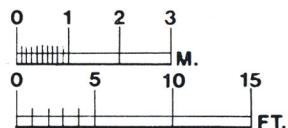


Avro Lancaster B.II, DS708, of No. 408 (Goose) Squadron, R.C.A.F. Based at Linton-on-Ouse, Yorks., at the end of 1943.





Queen of Spades playing-card
insignia on the nose of Q-Queenie.



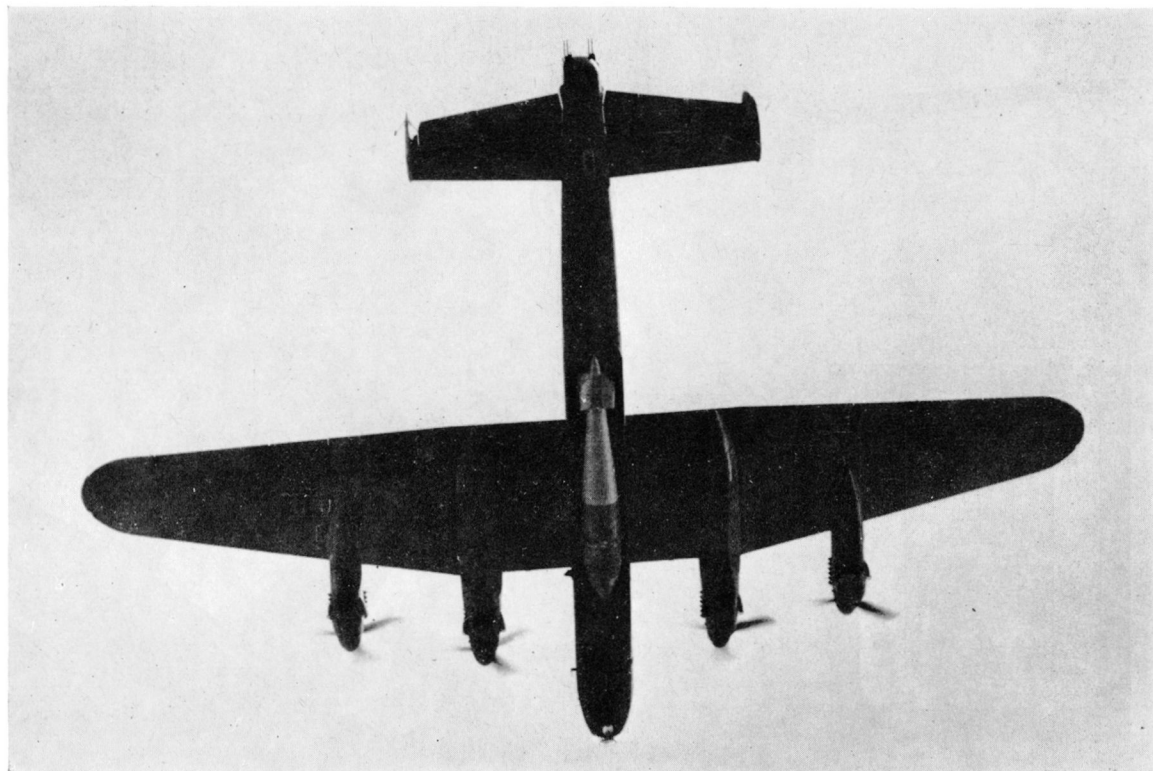
Unique study of a Lancaster B.I(Special) carrying a 22,000-lb. Grand Slam D.P. (deep penetration) bomb. This weapon, designed by Dr. Barnes Wallis, was first used operationally on 14 March 1945, when 617 Squadron used it to wreck the Bielefeld railway viaduct in Germany.

stowage; the dinghy was hanging out; the starboard fuel jettison sac was hanging out; the tailplane was riddled with cannon- and machine-gun fire; the fuselage had five cannon holes through it (three of the shells had burst inside, near the navigator); there were two cannon holes in the rear turret (one of these shells had whistled almost the entire length of the fuselage before exploding); there were hundreds of holes of all sizes in the kite; every prop blade had at least one hole in it, one being split down the middle; the starboard outer oil tank was riddled, and the starboard tyre was blown clean off. . . . But nobody was injured. It had been a good trip until we were attacked by the fighter.'

And the fighter? Both of 'Uncle's' gunners, Sgts L. R. Bandle and A. F. Dedaux, had opened fire simultaneously at 100 yards range, and loosed 500 rounds at it without taking their thumbs off the firing-buttons. The enemy's port engine caught fire just as he broke away. He went into a succession of dives and half-hearted pull-outs, finally spinning out of control until lost to view.

A little-known variant of the mighty Lanc. which saw limited service during late 1943 was the Mk. VI, which had the more powerful Merlin 85/87 series engines, each developing 1,635 h.p. Front and mid-upper turrets were deleted and in general the Mk. VIs were fitted with the latest *H2S* and numerous radar-jamming devices. Five of these machines were allotted to 635 Squadron of 8 (Pathfinder) Group in July–August 1943; it was the only squadron to operate with them regularly. The Mk. VIs sometimes carried the master bomber, but their main role seems to have been that of flying *Window*-spoof missions in order to mislead the German defences. The final operational sortie by a Lancaster VI was a trip to Neuss on November 27–28 1943.

The only other mark of Lancaster to see active service during World War II was the Canadian-built Mk. X, which was selected early in 1942 for production in Toronto by Victory Aircraft Limited. This version was fitted with Packard-built Merlin 38 or 224 engines and the 'first off' (KB700—aptly christened 'The Ruhr Express') was ferried to Britain in September 1943 by a crew from 405 'Vancouver' Squadron R.C.A.F. (a Pathfinder Force unit), and flew its first operational sortie on November 22–23, when it was



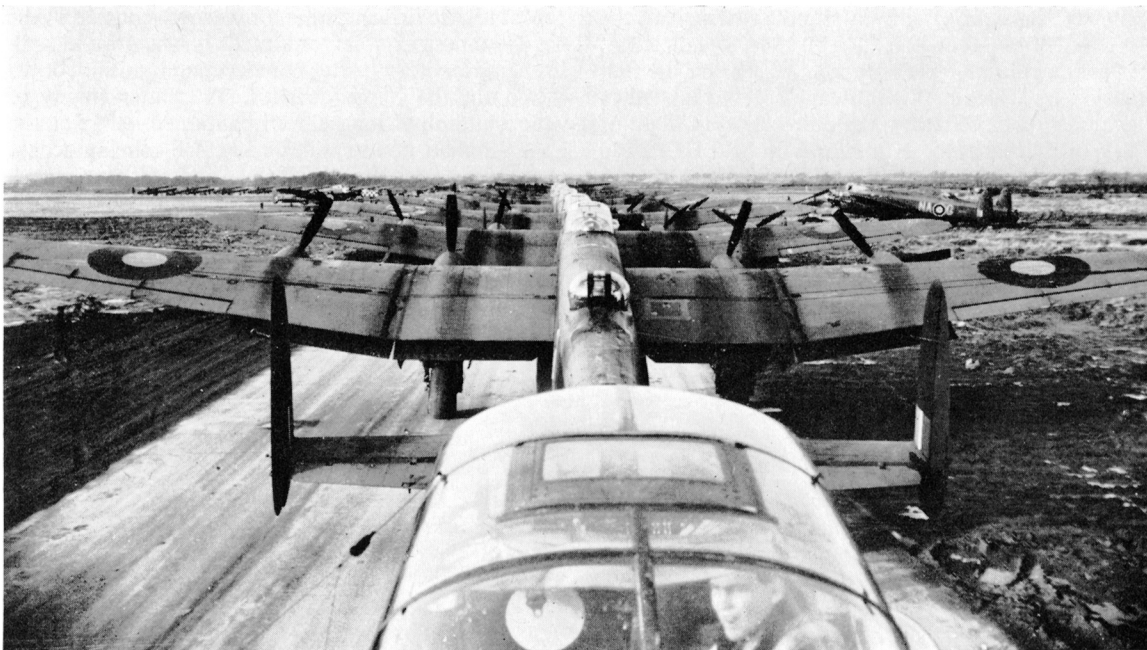
detailed to attack Berlin. Engine trouble rendered the mission abortive but five nights later 'Q-Queenie', as its identity letter denoted, set out again for Berlin and this time made the trip in fine style. Eventually, twelve R.C.A.F. bomber squadrons flew Lancaster Mk. Xs on operations in Europe; total production was 430.

By 1944 Lancasters had largely replaced the Halifaxes and Stirlings as the backbone of Bomber Command. Their epic operations in 1944–5 alone were legion. They bludgeoned Berlin a dozen times, scored one of the air war's two major classic strokes of deceit with their invasion fleet spoof in the Channel on D-Day, flooded the *Wehrmacht* on Walcheren Island by breaching a dyke at Westkapelle, blocked the Saumur tunnel, and sank the *Tirpitz* in Tromsø Fjord with Barnes Wallis's 12,000-lb. *Tallboy* deep-penetration bombs. Their greatest weight-lifting feat of all was first demonstrated on March 14 1945, when a 617 Squadron Lancaster I (Special), flown by W/Cdr C. C. 'Jock' Calder, delivered to the Bielefeld Viaduct a bomb whose weight compared favourably with the basic weight of the carrier aircraft—the

10-ton *Grand Slam*, air warfare's ultimate conventional weapon; this was yet another brainchild of Barnes Wallis. No other aircraft dropped as heavy a bomb or bomb load in World War II, not even the B-29 which weighed more than twice the Lancaster and had some 3,600 more horse-power working for it.

If the lifting ability of the Lancaster was remarkable, only slightly less remarkable were its flying characteristics. Aerodynamically superb in every way, it possessed the light handling qualities of much smaller aircraft. With a bomb load it was scarcely heavier on the controls than when empty. Yet its structure was unusually robust, enabling it to withstand the severe aerodynamic stress of a dive, loop, or roll, besides extensive battle damage.

A drama enacted thousands of times over war-torn Europe was the heavily-laden yet still nimble Lanc. being 'stood on its ear' while corkscrewing violently to evade a night-fighter. The drama was given a day-time setting on March 31 1945, when the *Luftwaffe* made its first and last large-scale interception by day of a Canadian heavy-bomber force. Lacking fighter cover



Lancaster Xs of 428 'Ghost' Squadron of the all-Canadian 6 Bomber Group marshalled at Middleton St. George (Co. Durham) ready for a raid.

because of a timing error, 6 Group's Lancaster gaggle was singled out over Hamburg for concentrated attack by some thirty Messerschmitt 262s—Germany's first operational jet interceptors—each piloted by a holder of the Knight's Cross of the Iron Cross. The Lancasters fought back as never before. For the first time in anger their Browning .303s blazed away from all three turrets at once. In all there were seventy-eight encounters and twenty-eight crews reported one or more combats with the pack of jets. Five Lancasters fell but at least four and possibly seven Me.262s also went down in the biggest air-to-air battle fought by a Bomber Command formation in daylight.

Perusal of dusty squadron records brings to light many long-forgotten tales of Lancaster exploits, but few can claim to be more hair-raising than this 'story of suspense' from the archives of 300 (Polish) Squadron. Lancaster III JA922 'J-Jig' (F/Sgt Z. Stepan) was one of more than a thousand aircraft bombing a target at Emieville, near Caen, on July 18 1944, when flak badly damaged it. The rear-gunner, F/Sgt M. Zentar, was rotating his turret searching for fighters at the time, and the blast swung the turret beyond its usual position, ripped open the door at Zentar's back and sucked him out of his seat. He fell out, but his left foot jammed in the doorway, and there he hung head downwards. The mid-upper

gunner and the flight engineer went to his aid but could not pull him in. His foot began to slip out of the shoe, so one of them grabbed his trousers, which, however, began to tear. The flight engineer now did a risky piece of work; he clambered out (the aircraft was now over the sea), precariously held in place—and looped a length of rope round the rear-gunner which he then made fast to the seat. He then returned to his task of nursing the damaged Lancaster back to base. The Lanc. limped home with the rear-gunner hanging head down from the tail, and those watching on the airfield saw him swing his head to one side to avoid hitting the ground as the bomber touched down. He was bleeding from ears and mouth, but was not badly hurt. He was subsequently able to boast of being the only man to have flow upside-down from Caen to Great Britain. Sgt J. Piachula, the flight engineer, was given the immediate award of the Conspicuous Gallantry Medal for his outstanding courage and initiative.

Another story of heroism is that of Lancaster III ND806 'S-Sugar' of 166 Squadron, which attacked Friedrichshafen on April 27–28 1944, after being set on fire by a fighter and then hit by flak. The rear-gunner was mortally wounded and the mid-upper gunner and flight engineer hurt. A wire had to be fixed to the control column to assist the Captain, P/O L.

Hunt, and the crew took turns at holding it, as Hunt was nearly exhausted. Over the French coast 'S-Sugar' circled and then headed back for Germany. Eventually the pilot managed to keep the bomber on some sort of course, and was escorted to England by two Spitfires.

Two months earlier, on February 19–20, another notable incident had occurred in the life of 166 Squadron, when Lancaster III LM382 'Q-Queenie' (P/O J. H. Catlin) was *en route* to Leipzig. The Lanc. was attacked by two fighters. A short-circuit caused all its lights to come on, and it did not respond to the controls. The rear-gunner had to operate his guns by hand, but nevertheless one of the fighters was shot down and the other hit.

Another squadron that seems to have had a fair share of excitement was No. 100, which operated for many months from Waltham (Grimsby), Lincolnshire. One story from its archives concerns Lancaster I ED749 'J-Jig' (F/Sgt F. Wadge) on a sortie against Stuttgart on February 20–21 1944. On the way home the aircraft collided with a German night-fighter. Wadge ordered his crew to prepare to bale out, but after diving more than 3,000 ft. control was regained and he flew 'J-Jig' safely back to an airfield in southern England (Ford) minus 6 ft. of wing and with part of the fighter still embedded in the bomber. On April 9–10 1944, Lanc. III JB557 'U-Uncle' (P/O J. D. Mortimer), of the same squadron, had a 'shaky do' whilst out on a mine-laying sortie on Gdynia harbour in bright moonlight. The Lancaster was severely knocked about by an Me.410, and set on fire. It dived for 14,000 ft. with the fighter on its tail. The fire was extinguished and the fighter shaken off, but not before the A.S.I. had registered 410 m.p.h. The trimmers jammed and the stick loads were relieved by tying some Mae West cords round the stick and lashing them to the pilot's seat-stay. Some of the strain was thus taken off the pilot by the rest of the crew, who took turns at hanging on the cord. Another 100 Squadron Lancaster III, LM619 'M-Mike', attacked the marshalling-yards at Vierzoon on the night of June 30–July 1 1944, and landed at Waltham without ailerons. It had been intercepted by a twin-engined fighter. The pilot, P/O J. D. Rees, had put his aircraft into a steep turn to port with 85 degrees of bank, whereupon it hit its own slipstream and turned upside-down. The bomber was on its back for 15 seconds and dropped from 12,000 to 4,000 ft. before Rees could regain control.

Two further noteworthy incidents that must be mentioned were the emergency landing of Lancaster III ND917 (S/Ldr N. A. Williamson), of 75 (New

No less than twenty-four Lancasters are known to have flown at least 100 operational sorties during the Second World War. Here is the record-holder, Mk. III ED888 PM-M2 ('Mike Squared' or, as its ground-crew preferred, 'Mother of Them All'), seen with 131 ops. to its credit—later increased to 140. 'Mike Squared' went from 103 Squadron to No. 576 and then returned to No. 103 and survived the war, only to be scrapped in 1947.

Zealand) Squadron, on a landing-strip in the Normandy beach-head on June 30 1944, when returning from a raid on Villers Bocage, this being the first occasion on which a British heavy bomber landed in liberated French territory; the destruction in flight of a V-1, or flying bomb, by a gunner in Mk. III PB286 of 207 Squadron (captain F/O Montgomery) during a raid on Stuttgart, on July 28–29 1944; and a similar 'kill' by a gunner in PD441, a Mk. I of 619 Squadron (captain W/Cdr S. G. Birch), during a raid on the Dortmund–Ems Canal at Ladbergen on March 3–4 1945.

Not all the drama of the air war was enacted in the air. Countless exploits took place on the ground both in enemy territory—after bombers had been shot down—and on the home airfields. The latter (many of which, although long since abandoned, still dot the East Anglian countryside) witnessed stirring scenes almost every day, but of all the Lancaster stories that have been recorded, none, perhaps, is quite so dramatic as the tale of events at Binbrook (Lincolnshire), on the evening of July 3 1943. Twenty-six Lancasters of 460 Squadron, R.A.A.F., were mostly all bombed-up ready for take-off at dusk and some of the crews were



already having their evening meal. Suddenly, through an electrical short-circuit, the entire bomb load fell from one Lancaster and the incendiary part of the load was soon burning fiercely beneath the aircraft. Two horrified ground-crew leaped out of the bomber and tried to roll the 4,000-pounder away but, seeing that it was hopeless, ran for safety. When they were 400 yards away the 'cookie' and two 1,000-pounders exploded, scattering the incendiaries among other Lancasters. The two airmen were blown to the ground but escaped with shock. Then the adjacent Lancaster caught fire and two minutes later its bomb load went up, scattering more incendiaries. The station's fire services rushed into action and directed by 460's C.O., W/Cdr C. E. Martin, extinguished as many of the incendiaries as possible. Another Lancaster was then seen to be on fire and Martin and F/Sgt A. E. Kan—the latter still shell-shocked from the original explosion—fought the flames with hand-extinguishers. With the flames partly under control another airman climbed into the bomber and disconnected the electric leads to prevent more bombs from being dropped to the

ground. By this time the fire was so intense that the magnesium contents of the fuselage flared up and the men, almost suffocated, had to leap out. Martin climbed on top of the burning, fully loaded Lancaster, and stood there directing fire operations until the flames were out. In half an hour the danger was passed and that night seventeen of the twenty-six Lancasters originally briefed for Cologne took off and happily all returned safely.

By the end of the war in Europe there were fifty-eight squadrons wholly equipped with Lancasters, including all the fourteen squadrons of 1 Group, the eleven squadrons of 3 Group, seventeen squadrons of 5 Group, eight squadrons of 6 (R.C.A.F.) Group, and eight squadrons of 8 (Pathfinder) Group—including two detached to 5 Group. Last operational missions in which Lancasters took part were on April 25 1945, when Hitler's mountain retreat ('the Eagle's Nest') and the associated S.S. Barracks at Berchtesgaden were bombed; and the following night when U-boat fuel-storage tanks at Vallö (Tonsberg) in Oslo Fjord were bombed and part of Oslo Fjord itself (off Horten)

mined. The Lancasters then turned to repatriating British ex-prisoners of war (Operation *Exodus*), and dropping food and other supplies to the starving Dutch (Operation *Manna*). It was on this happy note that the war for the mighty Lancaster ended.

To sum up the Lancaster's war record, statistically, the aircraft flew a total of 156,192 operational sorties (including 116 under the temporary control of Coastal Command), comprising 148,403 sorties on bombing raids (108,264 of them by night), 2,929 sorties on sea-mining, and 4,860 on 'other operations'—all believed anti-submarine sorties. Total tonnage of bombs dropped was 608,612 lb. (tonnage of mines laid is not known) and total casualties were 3,349 aircraft missing (including four on anti-submarine patrol with Coastal Command), and 487 destroyed or damaged (142 of them due to enemy action).

Sir Arthur Harris, Bomber Command's great war-time leader, once described the Lancaster as 'the greatest single factor in winning the war'. This is an exaggeration but it is a pardonable one. What can be said of the Lanc. without any fear of dispute is that it was (to quote the official history of the strategic bombing offensive): 'undoubtedly the most effective heavy bomber of the Second World War in Europe'; it is also true to say that it was a major instrument of victory.

Specification

Lancaster B.II (B.III data in parentheses where different): *Crew* 7; *power plant* four 1,650 h.p. Bristol Hercules VI or XVI (four Packard-built Rolls-Royce Merlin 28 (1,300 h.p. each), 38 (1,480 h.p. each) or 224 (1,640 h.p. each)); *span* 102 ft.; *length* 69 ft. 6 in.; *wing area* 1,297 sq. ft.; *empty weight* 36,449 lb. (37,000 lb.); *loaded weight* 63,000 lb. (65,000 lb.); *max. bomb load* 18,000 lb. (some 'Specials' modified to carry one 22,000 lb. 'Grand Slam'); *max. speed* 275 m.p.h. at 14,000 ft. (281 m.p.h. at 11,000 ft.); *service ceiling* 19,000 ft.; *range* 2,530 miles with 7,000-lb. bomb load, 1,730 miles with 12,000-lb. bomb load; *armament* twin .303 in. m.g. in nose turret, and four .303 in. m.g. in dorsal and tail turrets.

When the bombing offensive ended in April 1945 the heavies turned to happier tasks. Lancaster I PB726 'PO-P', of 467 R.A.A.F. Squadron, sets out from Waddington (Lincs.) for the Continent in mid-May 1945 to ferry home to England ex-prisoners-of-war.



Consolidated B-24 Liberator

Although the B-24 Liberator shared the honours with the Boeing B-17 Flying Fortress of being the principal American heavy bomber of World War II, it was a much later design, being originally built to meet a U.S. Army Air Corps requirement outlined to Consolidated early in 1939. The requirement was, in fact, for a heavy bomber of better performance than the B-17 then in production, a range of 3,000 miles being specified, together with a speed of more than 300 m.p.h. and a ceiling of 35,000 ft. The prototype, designated the XB-24 (39-680), first flew in December 1939 and incorporated several unusual design features, including the Davis patent wing of very thin section and high aspect ratio, and bomb-doors which rolled up like the top of a roll-top desk.

Production models were eventually released for export to Britain and France, initial deliveries to Britain—including some machines originally intended for France—being made in the spring of 1941. These machines were of the Liberator I type which had no turrets. Some, designated LB-30A, were used as transports on the Atlantic Return Ferry Service, whilst a larger number of armed aircraft went to Coastal Command for anti-submarine duties.

Next R.A.F. version—and the first one to be used as a bomber—was the Liberator II, which had no U.S.A.A.F. counterpart. It differed from the Mk. I in having a lengthened nose, and most of the 139

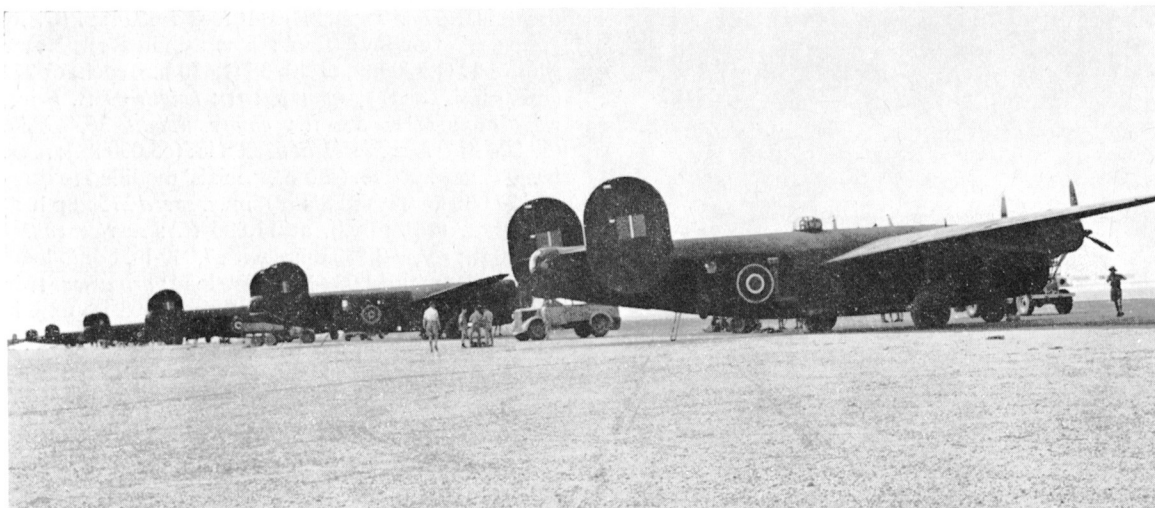
examples which reached the Service were fitted with four-gun Boulton-Paul power-operated turrets, one in the tail and another in a dorsal position. Next mark of R.A.F. Liberator to be used as a bomber was the Mk. III, British version of the B-24D. It too had four-gun Boulton-Paul dorsal and tail turrets, but the dorsal turret was further forward than that of the Mk. II. Final R.A.F. bomber marks were the Liberator B.VI and B.VIII—mostly B-52J and L models—delivery of which began during the latter half of 1944. Both marks had nose turrets and usually ventral ball turrets, although these latter were sometimes removed in service.

To return to the Liberator II. Some of the armed Mk. IIs went to Coastal Command but others became the first R.A.F. Liberators to be used in the heavy bomber role. These aircraft were flown by Nos. 159 and 160 Squadrons, which formed in January 1942 at Molesworth (Hunts.) and Thurleigh (Beds.), and were detained in the Middle East in June in 1942, whilst *en route* to India. They appear to have arrived in the Middle East about the same time as an important British convoy was taking supplies from Alexandria to beleaguered Malta, and their first task was to help provide it with air cover. No. 159 Squadron (Middle East Detachment), as it was known, operated under the control of No. 160 Squadron, and the Liberators were at first based in the Suez Canal Zone, together

with the first U.S.A.A.F. unit to operate in the Middle East—a formation of Liberators known as the Halverston Detachment.

Soon, however, Rommel's advance eastwards to Alamein forced all the Liberators (which incidentally were now supplemented by a squadron of Halifaxes from Britain) to withdraw to Palestine, their place in the Canal Zone being taken by the medium Wellington bombers formerly based in the desert. The Wellingtons, even though they used advanced bases for refuelling, could not only reach as far as Tobruk, but the Liberators—and also the Halifaxes—were able to range as far as Benghazi. The C-in-C. of No. 205 Group, which operated the bombers, issued an order: 'Tobruk and Benghazi harbours are the front and back doors through which the enemy is getting his supplies. The front door is slowly being closed to him. There must be no back door.' During July the front door of Tobruk was attacked in force thirty-three times, mostly at night but sometimes by day; the back door at Benghazi was attacked by heavy-bomber formations seven times during daylight. During August the Allied bombers continued to hammer Tobruk, making more than thirty-one big raids. On three occasions the Liberators made dusk attacks, appearing over the town while there was still sufficient light to see the shipping in the harbour. Each time they scored direct hits on large ships. These dusk attacks were made from a great height, the crews using oxygen and fighting intense cold. The oxygen-mask of a gunner in one Liberator—whether R.A.F. or U.S.A.A.F. is not known—actually froze while the aircraft was approaching the target. He fell unconscious to the floor and the mask was torn from his face, but nobody at that height had sufficient strength to move him into reach of it again. While the bombing run was in progress the navigator filled his mouth with pure oxygen from an emergency bottle, put his lips to those of the unconscious gunner and blew the oxygen into his lungs in time with the rhythm of his faint breathing. As the bombs fell, the man's life was saved.

All these raids had the cumulative effect of practically closing the enemy's front door of Tobruk and compelled him to divert most of his supply columns to Benghazi, whence they had to travel hundreds of



Liberator IIs of 159 and 160 Squadrons lined up ready to take off at a desert airfield circa July 1942. [Imperial War Museum.]

Fifty-five, not out. 'D-Dog', a veteran Liberator B.VI or VIII in Italy. The insignia seems to indicate that the machine had a pathfinder role, in which case it may have been a B.VIII of 614 Squadron.

miles over the desert by truck to Alamein. Benghazi was beyond the range of the Canal Zone-based Wellingtons, though they could still reach it from Malta. The heaviest blows were struck by a number of daylight-to-dusk attacks by the Liberators and Halifaxes, the targets being ships and harbour installations. Outstanding among the many raids made by R.A.F. and U.S.A.A.F. Libs. on Benghazi were a series of three made on September 16 and 22. On the morning of the first raid the Liberators set off from near Cairo and flew in close formation on their 600-mile journey to the target. At midday, still flying in perfect formation, they sailed out of the sun across Benghazi harbour, where a number of sizeable ships were off-loading on to 'George', 'Harry', and 'Johnny', wrecks which had been concreted in and had long served as the main unloading jetties. The Liberators pattern-bombed; several vessels received direct hits and burned, and the bomber crews as they left the scene saw one vessel suddenly explode with great force, flinging debris high above the harbour. All the Liberators returned safely.

The raid was repeated near dusk on September 22 and again in darkness six hours later. After the dusk raid the gunners saw a vivid flash of orange against the sky as a ship blew up violently. The night-bombers guided themselves to the target from a distance of eighty miles by the glow of a burning merchant-vessel.

Even the official report on the photographs taken during the three raids described the damage as 'spectacular'. During the first a supply ship of 6,500 tons, which had been off-loading on to 'George', was hit and set on fire. It had to be towed towards the outer mole where it burned itself out. In the second raid—the dusk one—the bombers hit a merchantman which lay alongside 'Harry'. It was apparently unloading either petrol or ammunition, for when it was hit it blew up and disintegrated with its battered stern flung right up on top of the mole.

The force of that explosion broke 'Harry', concrete and all, from the Cathedral mole and sank its stern; it overturned 'Johnny' on to its port side, leaving only the starboard rail awash; it sank two smaller merchantmen; it sank a smaller concreted wreck known to the bomber boys as 'Ink'; it burned out yet another merchantman that lay on the far side of the Cathedral mole; and finally it picked up a large iron barge and left it poised several feet above the water on top of



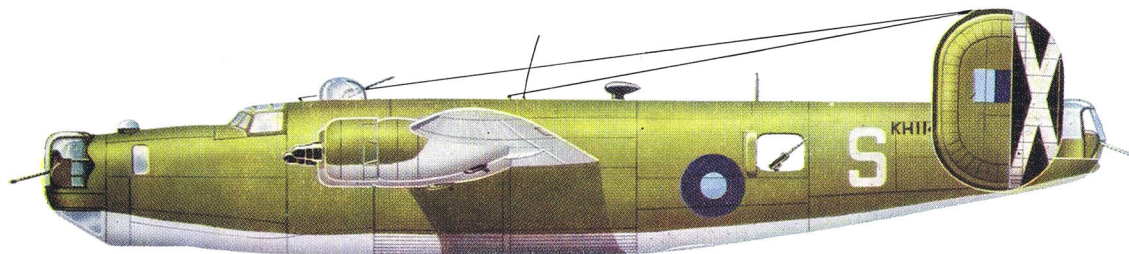
another wreck. The third raid, at night, completed the destruction of all this valuable shipping and off-loading space. 'It is probably an under-estimate', said the Short Official History of the R.A.F. in the Middle East, 'to say that those three raids, besides destroying so much valuable material and shipping, halved the value of Benghazi as the back door to Cyrenaica for the supplies the enemy needed so urgently after the disastrous failure of his September attack.'

The bombing of Tobruk and Benghazi was only part of the work performed by the R.A.F. Liberators during the latter part of 1942. They bombed many other targets in the Mediterranean theatre and sometimes ranged as far afield as the Corinth Canal (which they mined), Naples, and Tripoli.

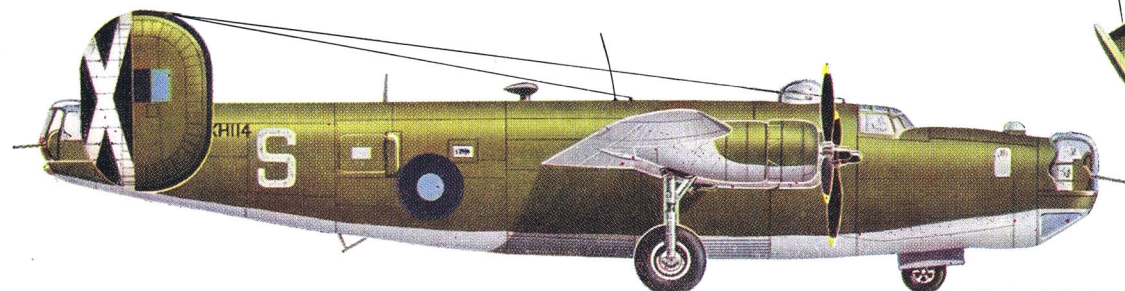
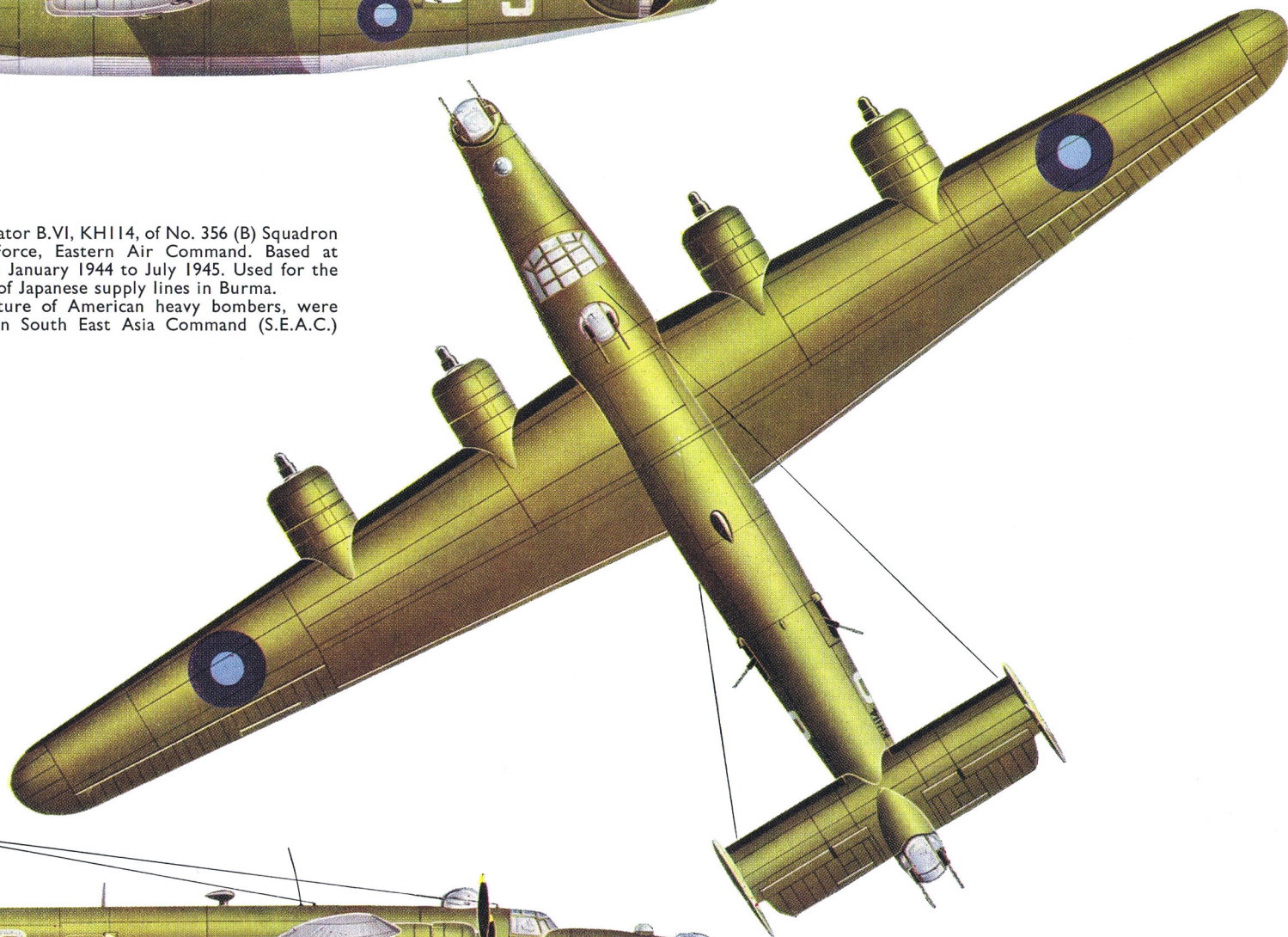
In January 1943 No. 160 Squadron (which had already absorbed the aircrew of No. 159 Squadron) merged with associated elements of Nos. 159 and 147 Squadrons to form No. 178 Liberator Squadron, whose role was also heavy bombing. Based in Egypt, then in Libya, and finally in Italy, No. 178 continued

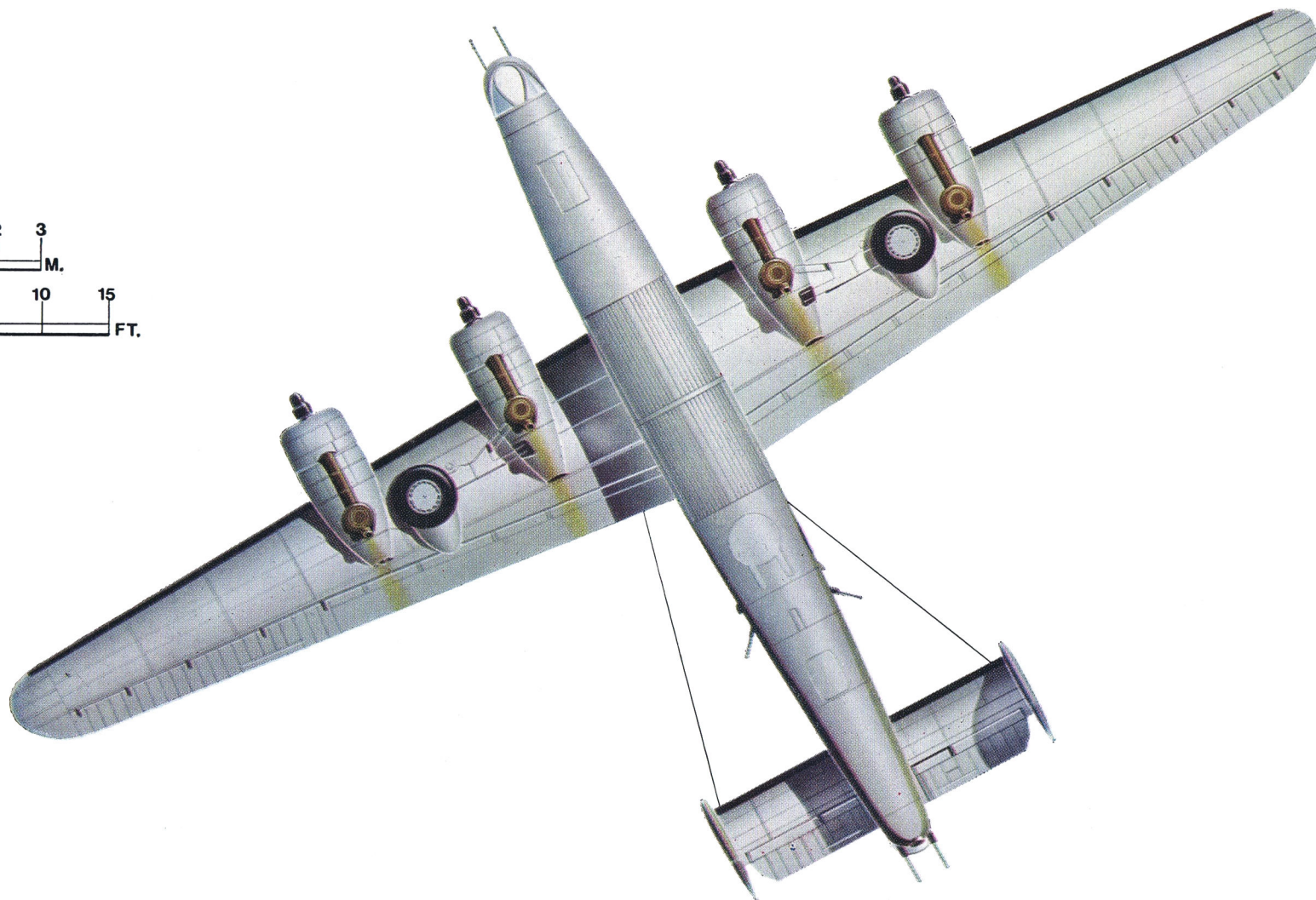
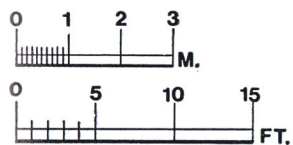
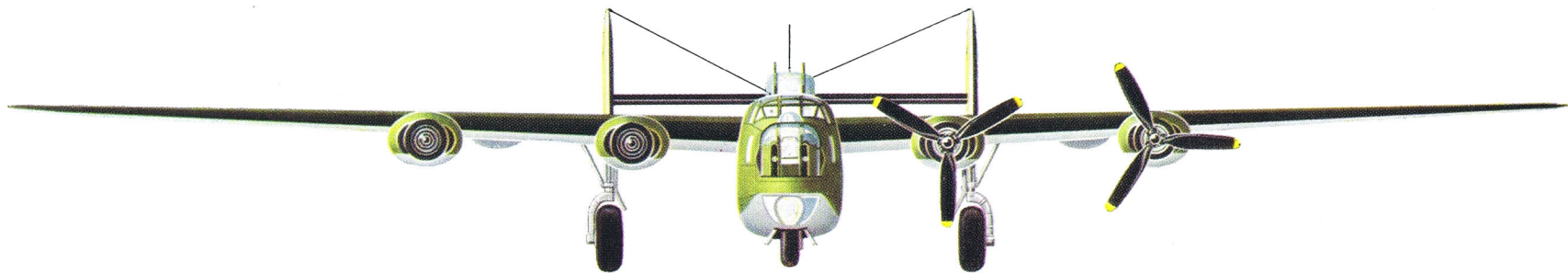
with Liberators for the rest of the war, although at one time it also flew Halifaxes. It flew Liberator IIs at first, then began to receive Mk. IIIs and VIs in the latter part of 1943, and in 1944 gradually changed over completely to Mk. VIs. Its activities with Liberators included bombing attacks on targets in North Africa, Sicily, Crete, the Aegean Islands, Italy, and the Balkans (including the Ploesti oil refinery in Rumania), minelaying (notably in that key supply route the River Danube), and supply-dropping to the Polish Home Army in Warsaw during the ill-fated rebellion of August and September 1944. For part of its early history the squadron was under the control of the U.S. Ninth Bomber Command, afterwards rejoining 205 Group.

Liberators formed the equipment of five more R.A.F. bomber squadrons which operated with 205 Group from Italy during the final months of the war. These were Nos. 37, 40, 70, and 104 Squadrons, all of which flew the Liberator VI, having previously flown the Wellington; and No. 614 (pathfinder)



Consolidated Liberator B.VI, KH114, of No. 356 (B) Squadron of Strategic Air Force, Eastern Air Command. Based at Salbani, India, from January 1944 to July 1945. Used for the strategic bombing of Japanese supply lines in Burma. Ball turrets, a feature of American heavy bombers, were usually removed on South East Asia Command (S.E.A.C.) Liberators.



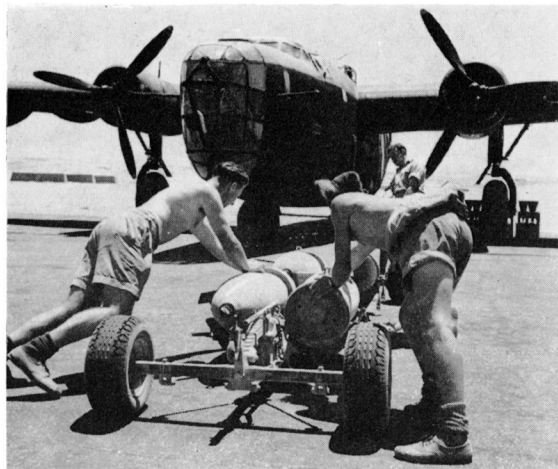


Squadron, which flew the Liberator B.VIII, which in this case replaced the Halifax.

Although their principal role was strategic bombing, these Liberator squadrons scored their greatest triumph when, early in April 1945, 205 Group switched over to tactical targets in close support of the 8th Army, which was about to make its final push. They bombed by night only 2,000 yards ahead of our own troops and greatly facilitated the latter's swift breakthrough on the Santerno River Line; this fine performance drew a congratulatory message from General McCreery, G.O.C. 8th Army.

Another theatre of war in which R.A.F. Liberator bomber squadrons fought was the Burma theatre. Six of them eventually served there, and these were Nos. 99, 159, 215, 355, 356, and 358 Squadrons, although the last-named only flew but one bombing mission, afterwards becoming a 'special duties' squadron. Together with some U.S.A.A.F. Liberator squadrons, the R.A.F. squadrons formed the Strategic Air Force of Eastern Air Command, and all were based for most, if not all, of the time in Eastern India. A few of these units—the longest-established—operated Liberator Mk. IIIs initially, but the Liberator B.VI and, to a lesser extent, the B.VIII were the types that were used most.

First squadron to serve in the Burma theatre was

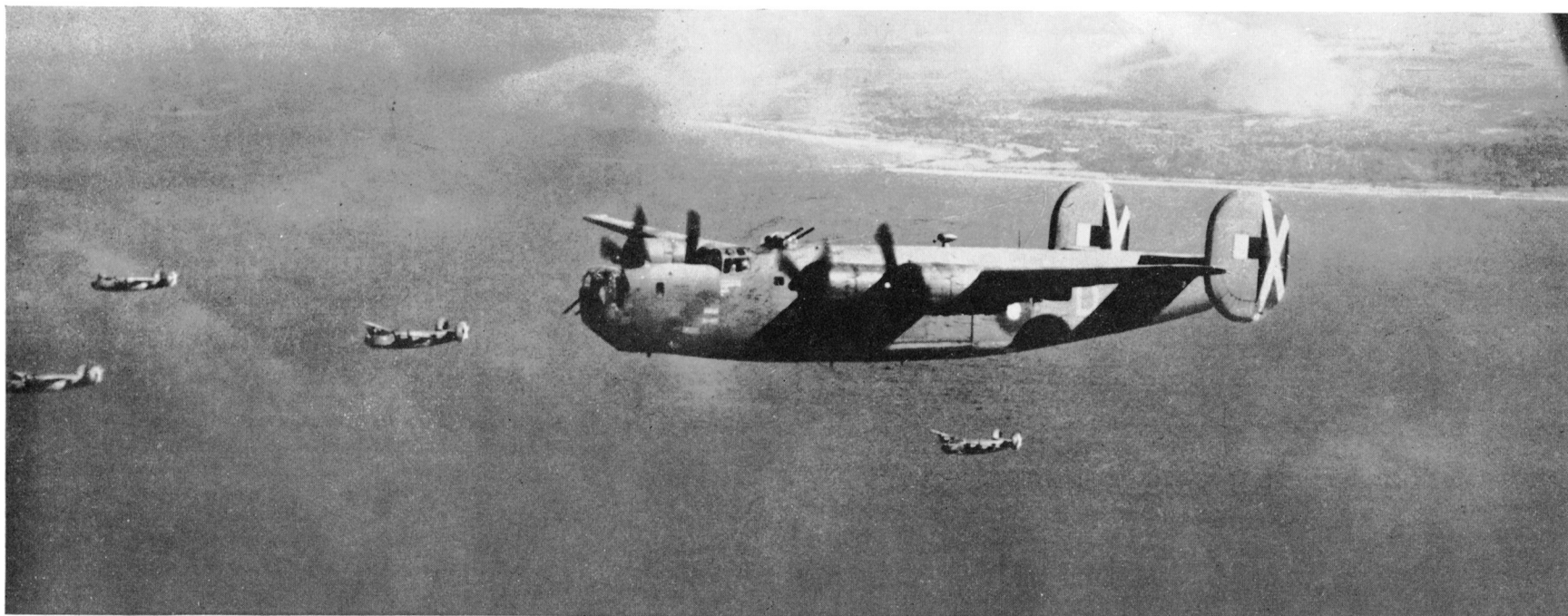


A bomb-trolley brings its load of destruction to a 159 or 160 Squadron Liberator II, which could carry 4 tons on a single sortie. Note the bomb-fins standing alongside the port main-wheel. [Imperial War Museum.]

Liberator B.VIs of 356 Squadron blasts Japanese positions on Ramree Island off the west coast of Burma just before the Allied landings in January 1945. An aircraft of this squadron (KH114 'S-Sugar'—and not KH119 as has sometimes been quoted in other publications) forms the subject of the five-view colour painting on pages 28 and 29. [Imperial War Museum.]

No. 159, whose Middle East detachment was mentioned earlier. This squadron began operations in November 1942 and eventually became the most famous R.A.F. Liberator bomber squadron of all—irrespective of operational theatre. Its main claim to fame was that it, or more specifically W/Cdr J. Blackburn, who was C.O. from July to December 1944, was responsible for greatly increasing the Liberator's striking-power. Here it is necessary to explain that one of the main tasks of Strategic Air Force's Liberators was the interdiction of the enemy's supply lines far beyond the battlefield—and notably the infamous Siam-Burma railway. Built by Allied prisoners-of-war under such appalling conditions that 24,000 of them lost their lives, this line was of the utmost importance to the Japanese. It ran for 244 miles through jungle and mountainous country, and along its length, spanning the succession of rivers and ravines, were nearly 700 bridges. The railway was bombed continually, sometimes by night but mostly by day, the Liberators concentrating on destroying bridges and obliterating tracks. Their greatest obstacle was neither enemy fighters nor flak, but the vast distances they had to fly.

However, by adjusting the American-built aircraft, W/Cdr Blackburn more than doubled the normal load. At the time he took command of 159 Squadron a



flight to Bangkok, lying 1,100 miles from the Strategic Air Force bases, was considered about the limit for a loaded Liberator. On such sorties the Liberators had to carry extra petrol-tanks which restricted the bomb load to 3,000 lb. Blackburn experimented with fuel consumption and, after demonstrating how it could be done, enabled his squadron to reach Bangkok with each aircraft carrying 8,000 lb. of bombs, or nearly three times what had been originally carried. The vast improvement in efficiency was commended by the Americans and the example followed throughout Strategic Air Force.

Long-range bombers had already flown from Bengal south to Rangoon, 1,600 miles there and back; and beyond Moulmein, 1,800 miles the return journey; now they reached Bangkok with four short tons of bombs, 2,200 miles, they went to the Kra Isthmus,

Working on the railway. Fine study of a R.A.F. Liberator of Strategic Air Force, Eastern Air Command, flying over a 200-ft. bridge on the infamous Burma-Siam railway about ten miles south of Thanbyuzayat, southern Burma, after it had been destroyed by 1,000-lb. bombs in a low-level attack early in 1945. From January to April of that year, the Liberators of Eastern Air Command kept an average of nine bridges perpetually broken between Bangkok and Burma—and they did so despite the ant-like activities of the Japanese, whose methods of constructing reserve bridges were particularly remarkable. [Imperial War Museum.



2,300 miles; finally a port on the east coast of the Malay Peninsula was put out of action by bombs from aircraft making a round trip of 2,800 miles, and Penang harbour was mined in a sortie of more than 3,000 miles.

By the beginning of 1945 both the R.A.F. and the U.S.A.A.F. elements, comprising a total of nine squadrons, were doing brilliant work flying Liberators farther than they had ever been flown before, carrying a greater payload over a greater distance.

The attack on the Siam-Burma railway was never neglected, and despite the ant-like activities of the Japanese whose methods of constructing reserve bridges was remarkable (at some points they threw as many as four across a particularly important ravine), Eastern Air Command succeeded in having an average of nine bridges constantly down between Bangkok and Burma, from January to April 1945. The broad result of these long-range attacks was to reduce traffic along the railway from 750 to 150 tons a day, a satisfactory result with a considerable influence on the land battle.

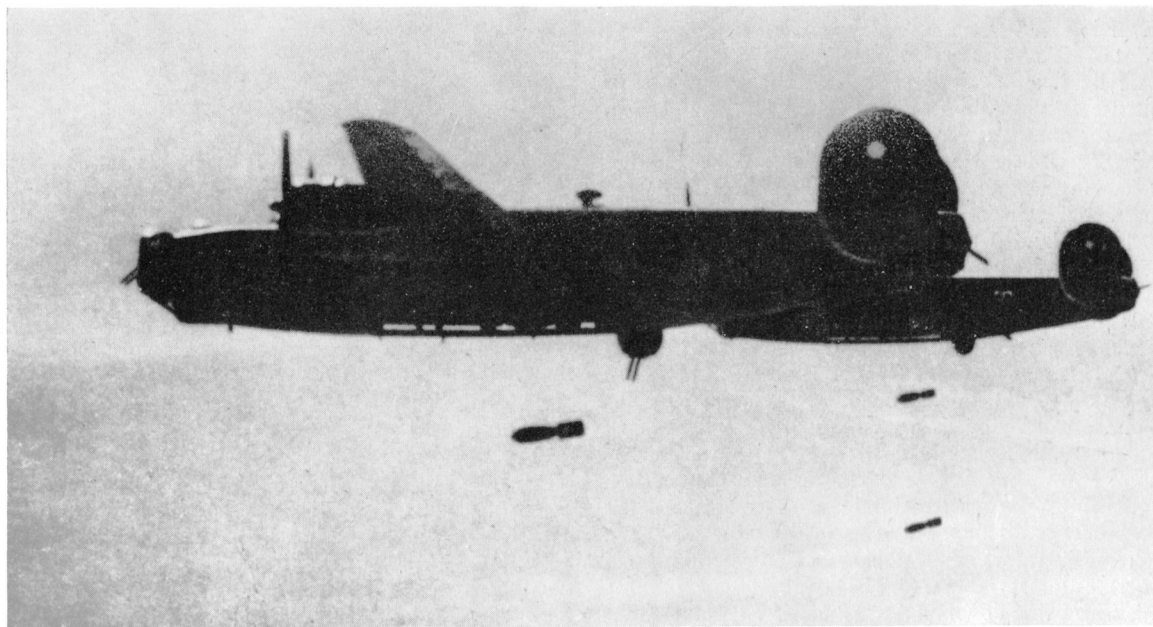
In the same way as 614 Squadron was chosen for the pathfinder role in the Mediterranean theatre, so was 159 Squadron selected to lead its contemporaries in the Burma theatre. This was in April 1945, and for its new role 159 was strengthened with picked crews from other Liberator units. By then it had already chalked

up a long list of very notable missions, and soon afterwards it won further laurels by finally destroying with bombs a 10,000-ton Japanese tanker in the Gulf of Siam, shortly after the vessel had been bombed and set on fire by Liberators of 356 Squadron. This was the biggest shipping prize of the war in South-East Asia.

The work of the Liberators not only included strategic bombing and mine-laying but also leaflet-dropping and, on occasion—and particularly in final stages of the campaign—tactical bombing in close support of our ground forces. An instance of a successful attack in this sphere was the Strategic Air Force's assault, on January 13 1945, on Mandalay, the heart of the enemy's defence in central Burma—now threatened by the Fourteenth Army. Preceded by fighter sweeps over the flak sites and the airfields, the Liberators attacked the Japanese quarter, levelling seventy major buildings and killing about 1,000 of the enemy.

In February 1945 two-thirds of the Liberator's entire effort was against targets requested by the Army

Liberators of 99 Squadron (white disc marking on black fin) in action against a Japanese airfield in Burma. In the later stages of the Far East campaign, the bombers' ball turrets were removed because enemy fighters were rarely encountered. [Imperial War Museum.



Right: A Liberator B.VI of 356 Squadron takes off on a mission from its base in the Cocos Islands in 1945. [Imperial War Museum.

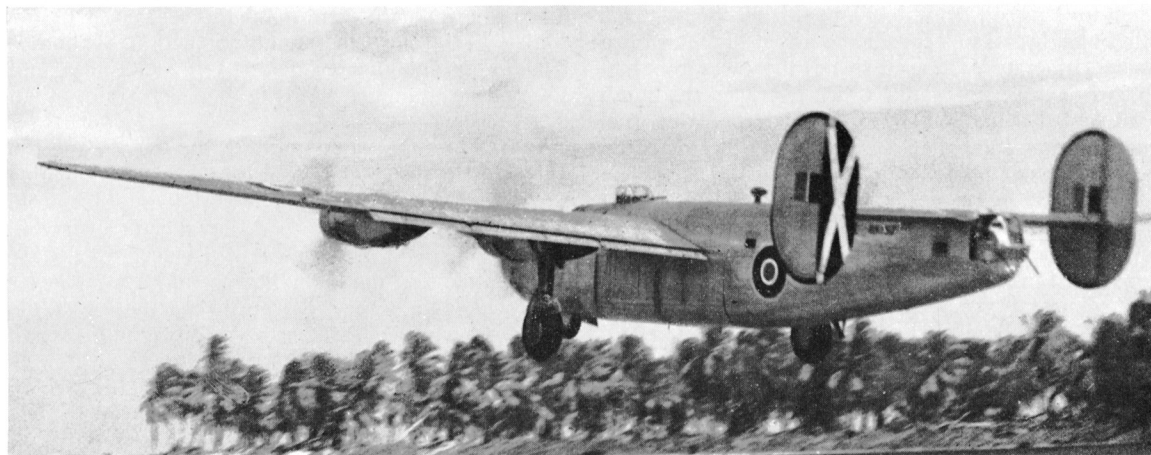
Below, right: warriors' end. Liberators of Eastern Air Command, including three machines of 99 Squadron (white disc markings on fins), derelict in a bombers' graveyard in India after the war. [G. A. Cull.

in or near the battle-front, including garrison zones, and undoubtedly these had great effect. 'We got a great kick out of helping the Army right on the spot', said one crew member of a 99 Squadron Liberator. 'Much of our work took us right into Siam, hitting at Japanese communications, but it had not the same thrill as we experienced in close support.'

Although Strategic Air Force's Liberator crews never encountered enemy opposition on a scale approaching that which the men of Bomber Command met over Europe, the Japanese did manage to make the going unduly rough at times. One such occasion was on February 1 1945, when 215 Squadron's Liberator 'H-Harry', captained by S/Ldr C. V. Beadon, was taking part in a daylight attack on locomotives and trains at Shitpyit, on the Burma-Siam railway. While over the target the bomber received a direct hit from an anti-aircraft shell. The rear gunner was killed and the aircraft's fuselage seriously damaged and set on fire. The Liberator was 1,000 miles from base, but although the fire continued for three hours before being finally extinguished, the bomber limped home safely. Another hair-raising episode was that involving F/O 'Johnny' Haycock, a New Zealand pilot of either a 99 or 159 Squadron Liberator, during a daylight raid against Rangoon. Caught in a cone of intense flak, his aircraft was repeatedly hit; rudder and elevator controls were badly damaged and the rear-gunner seriously wounded. Pulling out of the resulting dive, Haycock managed to retain control while his flight engineer repaired the damaged cables with cord. When he landed back at base four hours later, over 150 holes were counted in the Liberator. It did not fly again.

It was during another raid on the Rangoon area—on enemy gun-positions on May 2 1945—that W/Cdr J. B. Nicolson, R.A.F. Fighter Command's first (and only) V.C. winner of the war, lost his life. He was flying as a passenger in a Liberator of 355 Squadron, captained by one of the squadron's flight commanders. One of the engines caught fire, and being unable to maintain height and speed the bomber was ditched, only two of the crew surviving.

The Liberators of Strategic Air Force continued to operate almost right up to VJ-Day, their final bombing missions being flown on August 6 and 7 1945.



Specification

Liberator B.VI: Crew 8; power plant four 1,200 h.p. Pratt and Whitney Twin Wasp R-1830-56 or '90; span 110 ft.; length 67 ft. 2 in.; wing area 1,048 sq. ft.; empty weight 36,500 lb.; loaded weight 56,000 lb.; normal bomb load 5,000 lb. (max. bomb load of 12,800

lb. could be carried for short distances utilising wing racks); max. speed 300 m.p.h. at 30,000 ft.; usual combat operating speed range 180-215 m.p.h. between 10,000 and 25,000 ft.; service ceiling 32,000 ft.; range 2,290 miles with 4,000-lb. bomb load, 990 miles with 12,800-lb. bomb load; armament twin .50 in. m.g. in nose, dorsal and tail turrets, plus one .50-in. gun in ventral turret and at each waist position (ventral turrets often deleted in Far East theatre).

de Havilland Mosquito

Just as the Lancaster was undoubtedly the most effective heavy bomber of the Second World War in Europe, so was the Mosquito without equal as a light bomber. Built as a private venture by de Havilland, it was only slowly recognised by the Air Ministry as a potential bomber and even more slowly made into one. This was partly due to its extraordinary versatility, which enabled it to be used as a night-fighter, a photographic reconnaissance aircraft, a straight bomber, and a fighter-bomber.

As a straight bomber it had a remarkable performance. Originally intended to carry a bomb load of 1,000 lb., it doubled this, then doubled it again so that in its later versions it could carry a 4,000-lb. 'cookie' to Berlin and return to a British base. It hit the Germans by day and by night. It laid mines and closed

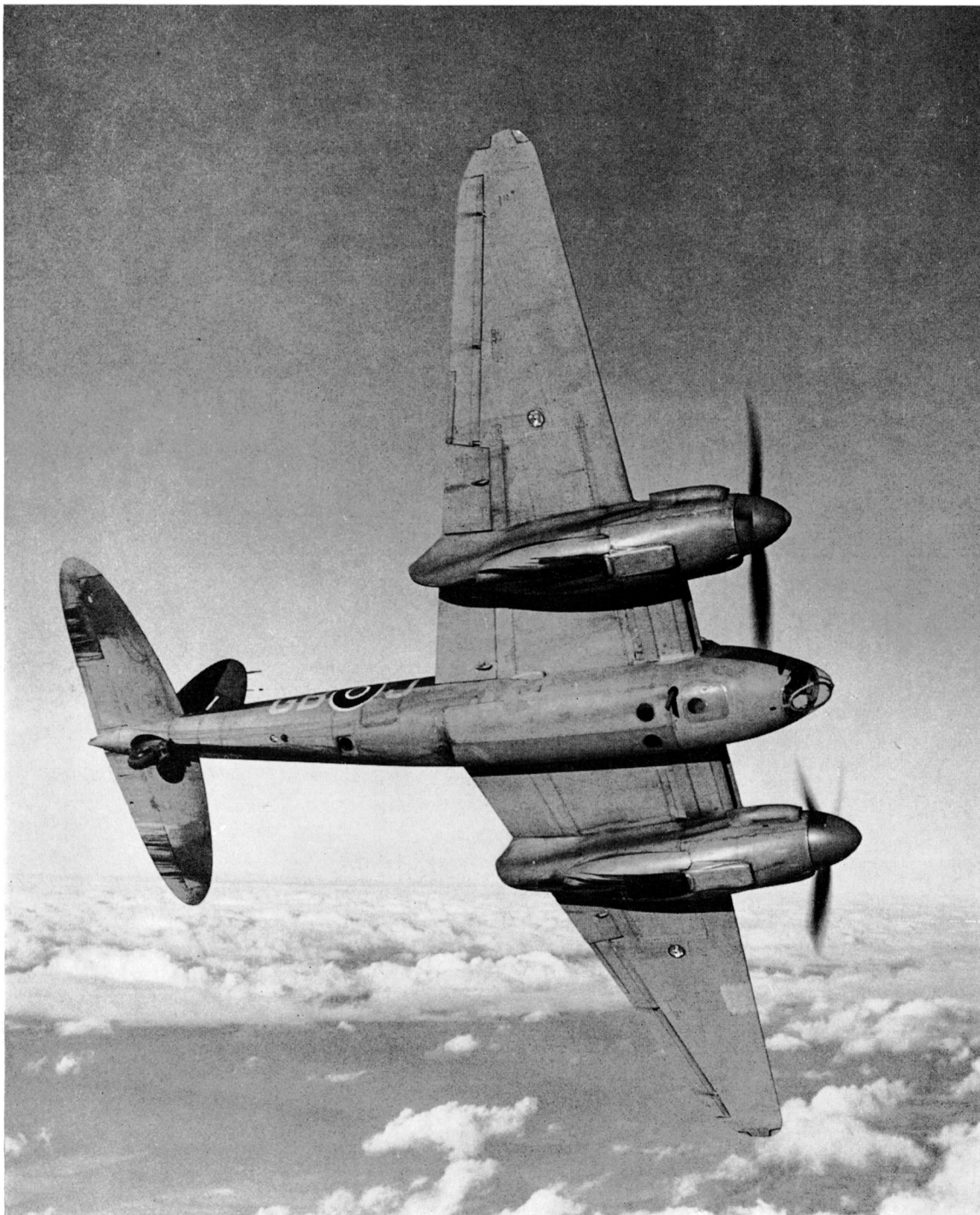
vital waterways to enemy shipping. It carried no armament, but because of its phenomenal speed and high-operational ceiling, it suffered negligible battle casualties. Its ability to reach 30,000 ft. and more was crucial in the use of the blind-bombing and target-marking system known as *Oboe*, for the range of this was dependent on the altitude of the aircraft using it. Its manoeuvrability and speed were no less vital in the development of low-level marking techniques.

Without the 'Mossie', the Pathfinder Force technique of *Oboe* marking could not have been evolved, nor could the 5 Group technique of visual marking, as pioneered by the legendary bomber-ace Leonard Cheshire of 617 Squadron, have become so effective. The Lancaster was far less manoeuvrable and could not reach a remotely comparable altitude.

The history of the Mosquito is very involved and only a brief outline is possible here. The de Havilland 98, as the type was designated, was the outcome of a design proposal of October 1938 for a small, fast twin Rolls-Royce Merlin-powered unarmed bomber of wooden construction. Air Ministry interest in the project was only aroused after the outbreak of war, and eventually, on March 1 1940, an initial production contract was placed for fifty bomber reconnaissance Mosquitoes, including a prototype, to Specification B.1/40, the basic requirements being a bomb load of 1,000 lb., a range of 1,500 miles, and the performance of a fighter.

A pair of Mk. IV bombers of 105 Squadron, Marham (Norfolk), pose for the cameraman during a local flight in December 1942. The second machine is 'J-Johnny'.





Fine study of B.IV DZ367 'GB-J' of 105 Squadron, December 1942. This machine failed to return after eight operational sorties. Note the oil-streaks. [Charles E. Brown.

The prototype (W4050) was built at Salisbury Hall, London Colney, in a small hangar disguised as a barn. On November 3 1940 it was taken by road to Hatfield, and there on November 25 it made its first flight, just four days short of eleven months from the start of detail design work, a truly remarkable achievement. Its performance was immediately impressive; it was highly manoeuvrable and twice as fast as anything that Hatfield had ever experienced before. It caused audible vortices at the wing-tips in a tight turn.

Most unusual feature of the Mosquito was the fact that it was built of wood. This was a departure from the normal metal construction and eventually led to the aircraft being dubbed 'the Wooden Wonder' and 'the Termite's Dream'. Two of the reasons for de Havilland's choice of wooden construction in 1938 were that it would, in the event of war, make for ease of dispersed manufacture (they particularly had the furniture industry in mind) and, secondly, it would husband metal resources.

Manufacturer's preliminary trials of the prototype Mosquito (which, incidentally, is now preserved at its birthplace, Salisbury Hall) were completed in three months, and established the 'Mossie' as the world's fastest combat aircraft. It remained the fastest, on Allied or enemy side, for two and a half years of its operational career. Modifications as a result of the trials were few, the most troublesome being the extension of the engine nacelles aft, which involved dividing the wing-flaps. In February 1940, W4050 was handed over to the A. & A.E.E., Boscombe Down, for official trials, and was duly rated, among other things, 'pleasant to fly', with 'aileron control light and effective'. Take-off and landings were regarded as 'straightforward' and the machine 'accelerated rapidly as the undercarriage was retracted and its rate of climb was high. The aeroplane handles well at all speeds.'

The original Mosquito contract was several times amended in the period up to July 1941, and in the end only nine production bombers resulted from it, the remaining machines being fighters, photo-reconnaissance aircraft, trainers, and various prototypes.

First production Mosquito bomber was the Mk. IV. It existed in two main versions—the Series I, of which nine were built, and the Series II (292 built), which could be identified by longer nacelles extending aft of the wing. Early in the Mosquito's history, de Havilland engineers discovered that if bomb-vanes were cropped it was possible to carry four 500-pounders instead of

B.IV DZ360 'A-Apple' of 105 Squadron being refuelled at Marham in December 1942.

the intended 250-pounders, and as a result the aircraft's hitting power was doubled before it even entered service.

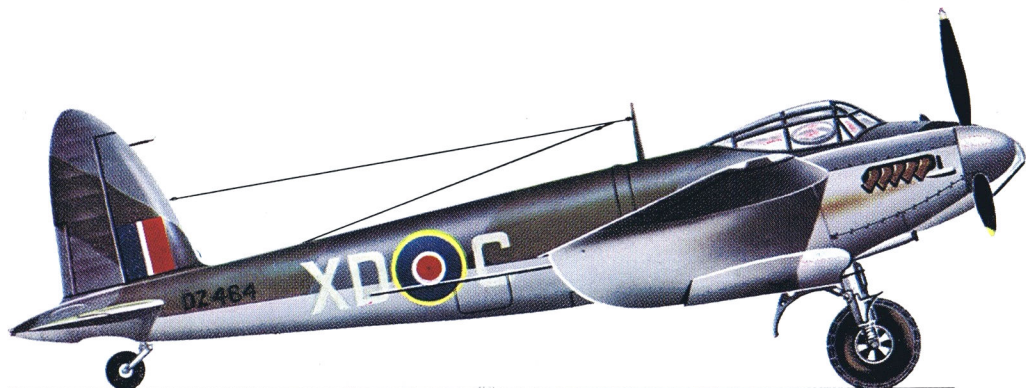
The honour of being the first Mosquito bomber squadron went to No. 105 (2 Group), based at Swanton Morley, Norfolk, and it was this unit which, on May 31 1942, inflicted the first 'Mosquito bite' on the enemy by making a daylight attack on Cologne as a follow-up to the R.A.F.'s '1,000-bomber' raid on that city the previous night. Four Mosquitoes were despatched and one of them failed to return. Not until September 26 1942 was the existence of the Mosquito officially disclosed to the British public, the announcement coming with the news of a daring low-level attack made the previous day by 105 Squadron on the Gestapo headquarters at Oslo.

By that time No. 105 had already begun to develop its own method of low-level high-speed attacks, and thereafter it continued to do so with renewed vigour, again applying them with success in the daylight raid on the Philips radio and valve works at Eindhoven on December 6 1942. Two distinct types of low-level tactics were gradually developed—the really low-level and the shallow dive; they were frequently employed together on the same target. The low-level attack was delivered by a single Mosquito or a small formation which approached the objective from the lowest possible level and released their bombs as they flew across it. The shallow dive attack was made by a second formation which climbed rapidly to about 2,000 ft. just before the target area was reached and then peeled off and dived straight down on to the target, releasing their bombs at about 1,500 ft.

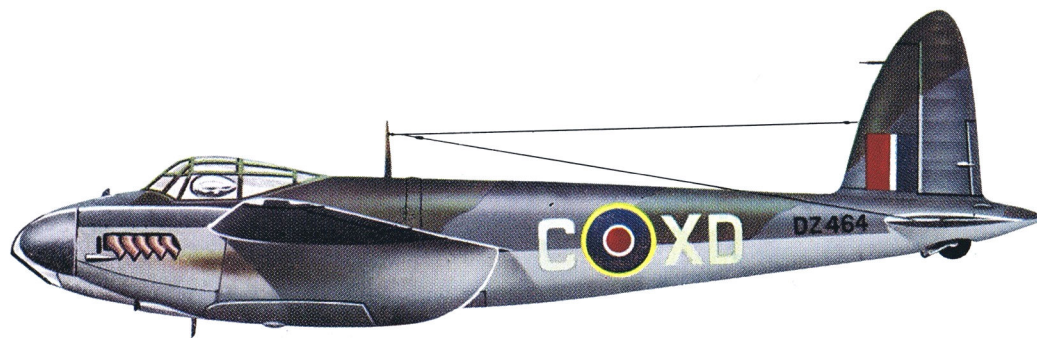
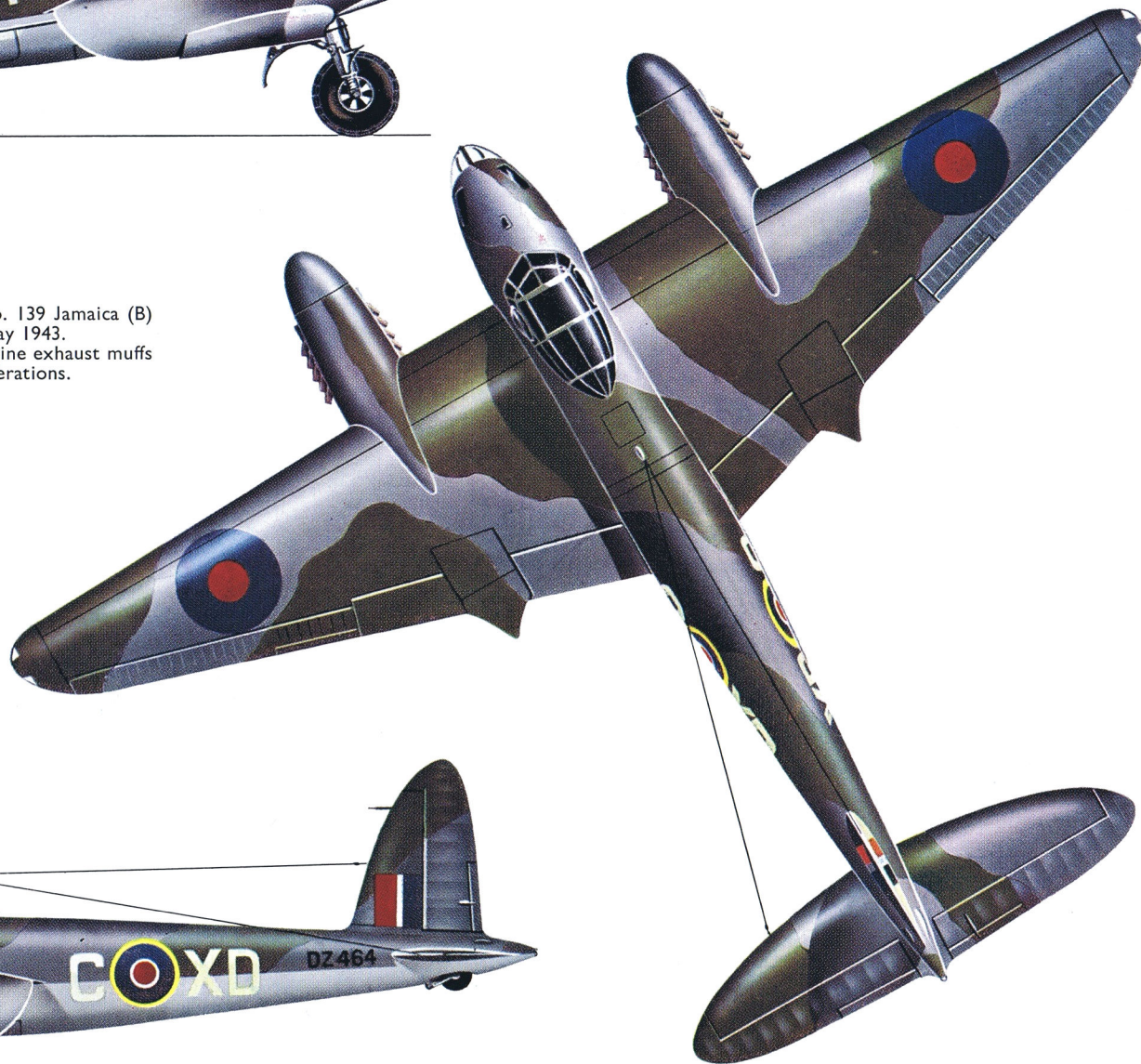
When these methods were combined both formations would be led by one leader whose navigator was entirely responsible for guiding the whole force to the target—a difficult task when flying low over enemy territory at high speed. When the two sections parted company the low levellers would drop bombs fused for eleven seconds' delay. The operation was so planned that the shallow divers began their dive as the last of the low levellers got away and their bombs were fused to explode instantaneously. Accurate timing was thus of the utmost importance. If the interval between bombing was too great the shallow divers would meet a hail of flak from the enemy guns alerted by the

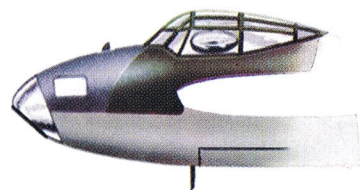


Five B.IVs of 105 Squadron taxiing at Marham in December 1942. 'A-Apple' flew three sorties with 139 Squadron and was shot down by flak on December 22 1942 flying with 105 Squadron. [Charles E. Brown.

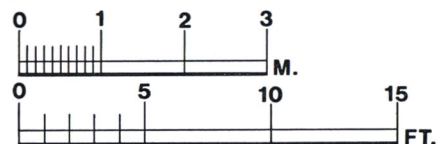
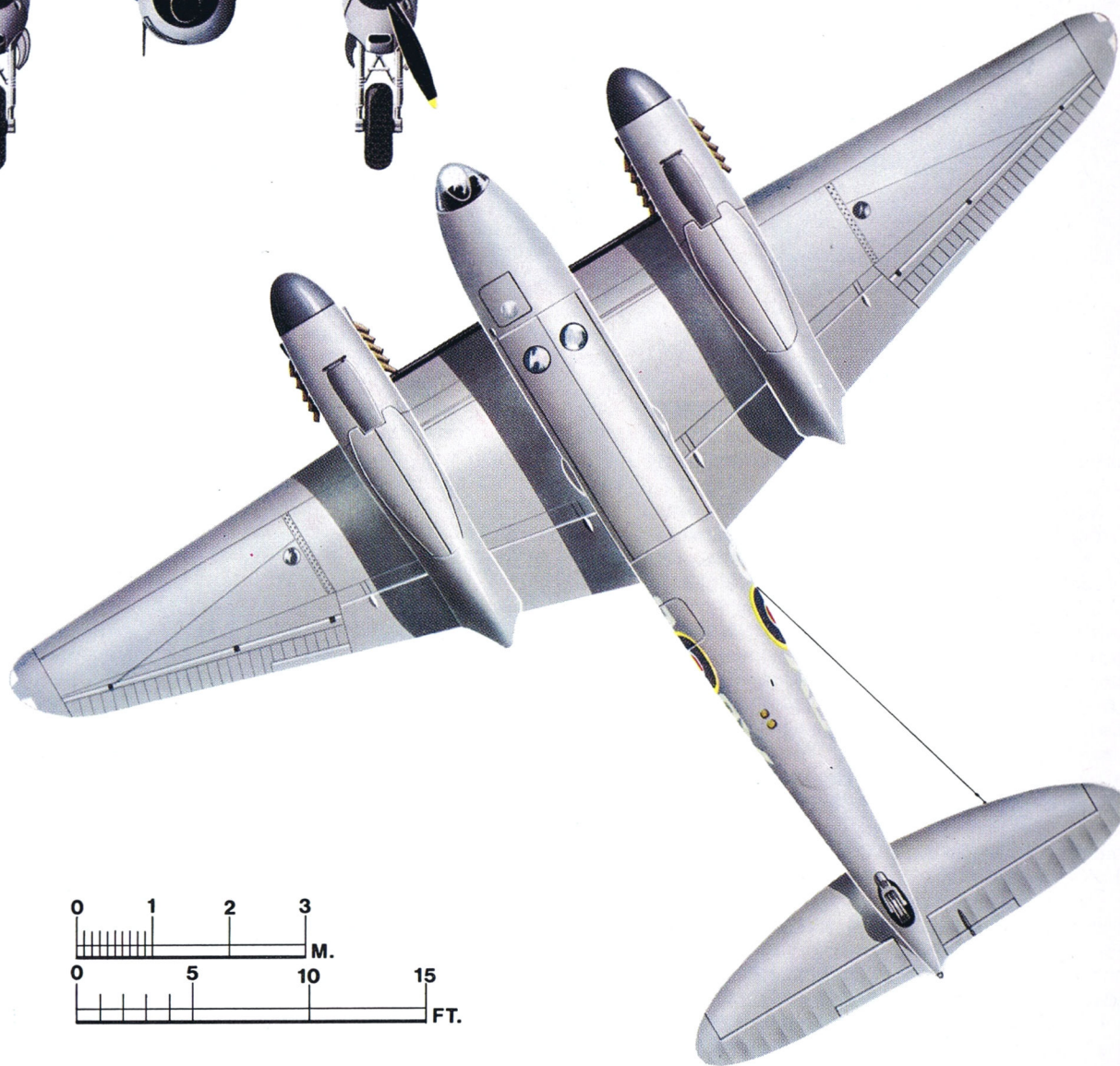
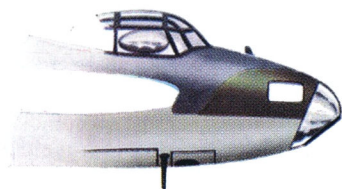


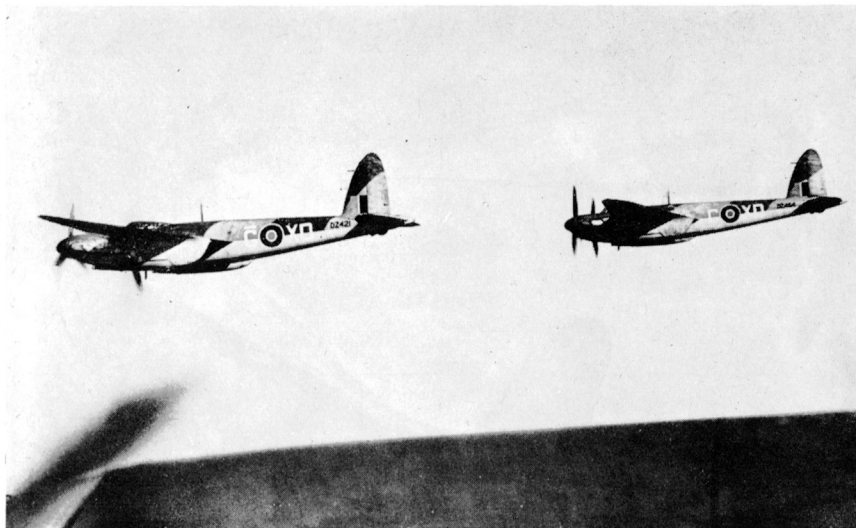
de Havilland Mosquito B.IV, DZ464, of No. 139 Jamaica (B) Squadron. Based at Marham, Norfolk, in May 1943. The aircraft is illustrated here with the engine exhaust muffs removed, as was sometimes the case on operations.





Camouflage pattern on the right-
and left-hand side of the nose.





B.IVs DZ421 'George-bar' and DZ464 'C-Charlie' of 139 'Jamaica' Squadron pictured together during a sortie from Marham. 'C-Charlie' is featured in the five-view colour painting on pages 36 and 37.

low-level attack; on the other hand, if the formations bombed too close together, the low-level aircraft risked being showered with the instantaneous bombs from the diving formations above them.

A second Mosquito B. IV squadron began to operate in 2 Group during the winter of 1942–3—139 'Jamaica' Squadron—and before long both units had developed their training to such a pitch that they were able to combine in low-level attacks, one squadron forming the low-level section and the other the shallow divers. A particularly successful combined attack was made on January 27 1943, when both squadrons, led by W/Cdr Hughie Edwards, v.c., C.O. of No. 105, bombed the Burmeister and Wain diesel-engine works at Copenhagen.

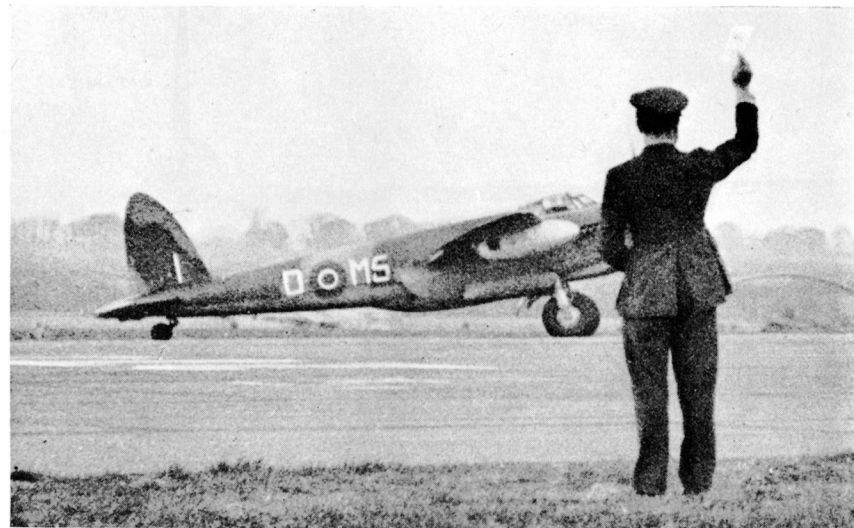
The two squadrons ranged far and wide over North-West Europe, and considering the hazardous nature of their missions, the losses they sustained were remarkably light, largely due to the Mosquitoes' terrific speed. Although docile and easy to handle, it was a nasty, vicious little brute to have to tackle, and many a German pilot found it both a tough and elusive adversary.

Sometimes sea-birds, which came to be known to the Mosquito boys as 'Quisling Ducks', achieved far more success at interception than did the German fighters. Such was the case during an attack on Tours by 139 Squadron in February 1943. One Mosquito

(DZ423, Sgt Cummins) ran into a flock of them off the French coast. The bomb-aimer's Perspex panel was shattered, the starboard mainplane was badly holed, and a bird was found protruding from the port wing. The navigator received a cut over the eye and a mouthful of feathers. The aircraft pressed on, and the rest of the trip was draughty in the extreme, with augmented boost being used to counteract the extra drag. This was not the first time that a Mosquito had had a brush with a flock of birds, and bullet-proof windscreens appeared to be the only answer. These were eventually fitted and although they undoubtedly reduced the risk of bird penetrations they did not end it completely, as squadron records prove.

'Mossies', even when severely damaged, often reached home safely, and there were numerous instances of young pilots, some on their first operational sorties, returning to base, as one of them put it, 'in a large hole held together by pieces of aeroplane', and then making successful forced-landings. The Mosquito was capable of flying on one engine almost as easily as on two, which led one humourist to remark: 'de Havilland's built the Mosquito as a single-engined kite, and then they slapped another one on to see what would happen.'

105 Squadron had moved to Marham, Norfolk, at the end of 1941, and it shared this airfield with 139 Squadron from late 1942 onwards. Whenever the squadrons set out on ops. the entire station turned out to watch, and each leader would vie for the honour of bringing his formation lower across the airfield than anyone else. They usually remained at 'deck level' all



B.XVI PF428 'D-Dog' of 128 Squadron, Light Night Striking Force, prepares to leave Wyton (Hunts) for a night raid on Berlin on March 21 1945.

the way to their target, where they would appear, seemingly from nowhere, administer their stings and be gone, often before the German fighters or anti-aircraft guns could swing into action. Even if the gunners at the German flak posts were waiting ready, the target was so swift that accurate sighting was difficult. The Focke-Wulf 190 was a respected foe, but the Mossie's camouflage of dull silvery grey and green blended well with the countryside and was very hard for prying eyes to discern from above. To the people of the occupied countries the Mosquito came to be an ambassador during their darkest hours, and as the bombers streaked overhead they often used to wave their recognition. They came to know the deep powerful tone of the twin Merlin engines and to welcome the sight of a pack of 'Mossies' streaking across their towns, fields, and villages. A particularly unforgettable memory of many crews was that of racing across The Hague at midday on a bright spring morning, while the Dutchmen below hurled their hats in the air and beat each other over the back.

There was a splendid morale-booster on 30 January 1943, when three Mosquitoes of 105 Squadron timed their arrival over the German capital to coincide with the delivery of a speech by Goering to a typical Nazi rally at the *Sportspalast*. The speech was to be broadcast and the announcer had just begun his introductory remarks when he was interrupted by a dull explosion and a babble of excited voices. After

some confusion the announcer said that the Field-Marshal would be delayed for a few minutes. The minutes lengthened to a long hour filled with the inadequacies of martial music. Then, and only then, did Goering begin his speech. Later the same day more Mosquitoes, this time from 139 Squadron, tried to interrupt a speech by Hitler's Propaganda Minister, Dr. Goebbels, but evidence from the radio indicated that his was a subterranean performance and not the grand hysteria planned for the rally in the *Sportspalast*.

During the next few months the two Mosquito squadrons kept up their daring and effective daylight harassing attacks, among the centres visited being Copenhagen (diesel workshops), Le Mans (Renault aero-engine works), Liège (armaments factory), and Paderborn and Nantes (railway maintenance facilities).

A particularly outstanding raid came on March 3, when 139 Squadron attacked the Molybdenum* washing-plant at Knaben in Norway at almost full squadron strength. This target was rated high in importance. S/Ldr Bagguley, 'A' Flight Commander, was detailed to lead his formation in a low-level attack, and was to be followed by the shallow divers led by the C.O., W/Cdr Peter Shand. Everything went according to plan. Some excellent navigation led to the location of the target—it was at an isolated mine in the Norwegian mountains—which was attacked with great accuracy. All the crews were confident that not a single bomb was wasted and photographs later confirmed this. One aircraft failed to return from this operation (shot down by FW190s); another was badly hit but crash-landed safely. Four officers were awarded the D.F.C. Here is the raid report by the leaders of the low-levelers, S/Ldr Bagguley and his navigator, F/Lt Hayden, who were flying in Mosquito DZ469:

'A very successful trip indeed, with the most of the credit due to Flight Sergeant Handley for damned good navigation. After we had crossed the Norwegian coast, we Low Level boys had a nice spot of difficulty in climbing up the rather steep ravine (crevice is more applicable) at the northern end of the Sirdale Lake. Everyone made it, however, and the much studied pin-point of Risnoes was picked up. From then onwards it was a piece of cake. The target appeared just as per illustrations, and was clearly silhouetted against the snow of the surrounding mountains. We made a perfect run on and dropped our bombs from roof-top height. (The crew following us report having seen them go through the roof.) We did a climbing turn away



Above and below: A 'cookie', bearing Christmas greetings to Hitler, is manoeuvred into position for loading into Mosquito B.XVI MM199 'M5-Q' of 128 Squadron, L.N.S.F., at Warboys (Hunts), December 1944. The Mosquito's bomb-sight has been crudely removed from the photograph by the wartime censor.



from the target and I could see the Shallow Dive boys' bombs on the mine buildings.

'The rest of the trip was entirely without incident, the most hazardous moments being those spent in endeavouring to relieve myself after the excitement.

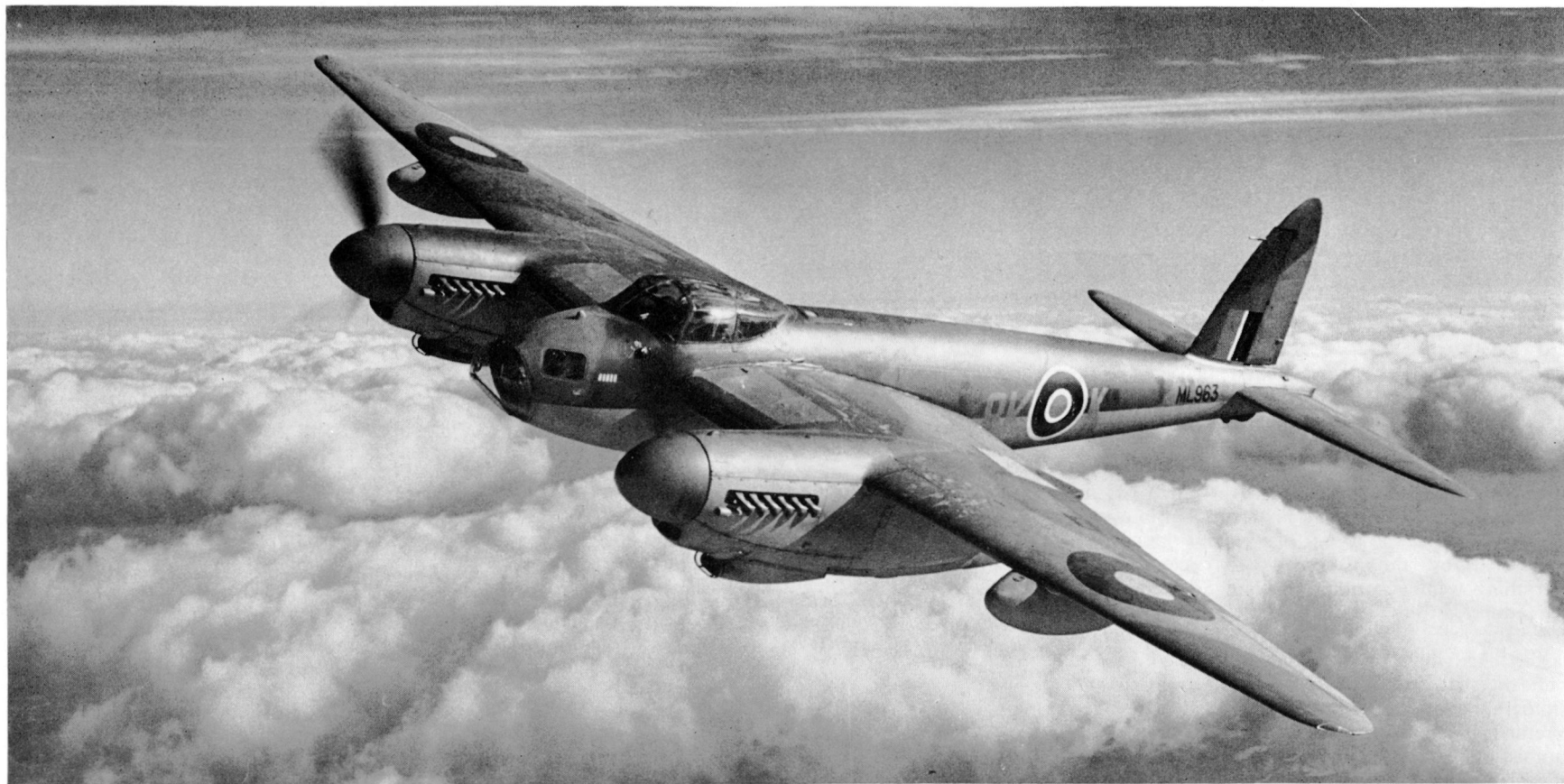
'A small point of interest remains. One of our long-delay bombs (36 hours) was a little premature and exploded within five seconds. The following aircraft (Cussens and Munro) didn't think much of this.'

Towards the end of April 1943 the character of 105 and 139 Squadrons' operations began to change: daylight and dusk raids at low level began to give place to night raiding at heights of over 20,000 ft. One of the first of these raids was on Berlin, when No. 139 was unfortunate enough to lose its C.O., W/Cdr Shand's place being taken by W/Cdr R. W. Reynolds.

On May 27 came the last low-level dusk raid that the two squadrons made and, fittingly, it was the most ambitious operation yet attempted by low-flying Mosquitoes. The target, Jena, lay 300 miles inside Germany, about forty-five miles to the south-west of Leipzig, and all told the raid involved a flight of nearly 1,000 miles at extremely low level. Six Mosquitoes of 139 Squadron, led by W/Cdr Reynolds, were briefed to attack the optical glassworks of Schott and Genossen, while eight Mosquitoes of 105 Squadron, led by S/Ldr W. W. Blessing, R.A.A.F., hit the Zeiss optical instrument factory. The whole formation successfully penetrated the Dutch coastal defence zone; two aircraft of No. 105 were lost near Hemlinghausen and a third from the same squadron had one engine shot out. It bombed a railway-bridge near Kassel and returned safely.

The remainder ran into very bad weather with cloud down to ground-level just as the route passed through hilly country, and at times they had to use their navigation lights to maintain formation. All persevered but nevertheless the formation was split up, and only three aircraft of each squadron were in contact when they broke cloud near Jena. These flew up the last

*A metallic element used in the production of high-speed steels.



The Mosquito's sleek lines are emphasised in this pleasing study of B.XVI 'K-King' of 571 Squadron during a test-flight from the de Havilland Company's airfield at Hatfield on 30 September 1944. At that time the machine (which is illustrated in colour on page 44), had recently undergone major repair following battle damage, hence the grey-primed panel on the port wing. In late October it was returned to 571 Squadron.

valley in bad visibility and were suddenly confronted with a balloon barrage which had not previously been reported.

S/Ldr Blessing and another Mosquito of 105 Squadron flew directly through the balloons and bombed the Zeiss works. The other machines in his formation tried to skirt the balloon barrage by flying up the mountain-side, but ran into flak, so it turned through the balloons to attack the glass-grinding factory in the centre of Jena, its sixteen-storey building presenting him with a conspicuous landmark. Another 105 Squadron Mosquito, which had lost contact in

cloud, found Jena and bombed a factory on the outskirts in time to withdraw with the others.

The three 139 Squadron machines all penetrated the balloon barrage and bombed the Schott works on the outskirts of the town in the face of intense flak. W/Cdr Reynolds was wounded in the leg and hand but he reached base safely. A fifth pilot of No. 139 came back for a long way on one engine, reached an English airfield safely but had the misfortune to hit a high-tension cable while landing. Both he and his navigator were killed. Only one of the original six from the squadron made the trip 'without incident'.

The problems attached to low-level navigation are worthy of comment. From a height of 1,000 ft. or more, map reading in reasonable visibility is not unduly difficult. At very low level, with the horizon telescoped to a mile or less and landscape features coming up in the oblique rather than as a bird's-eye-view, the technique is much more difficult. The secret lay in very

thorough planning before the flight: close scrutiny of maps and photographs so that landmarks could be memorised and recognised instantly as they flashed past the Mosquito at 300 m.p.h. Successful navigation of this kind, performed over 800 miles of enemy territory in poor visibility and in the face of heavy enemy opposition, was a feat beyond praise.

Talking of low-level flying, there is a good story concerning a diversionary attack which 105 Squadron made on the U-boat yards at Flensburg on July 6 1942, in connection with the Lancaster raid on Danzig (see page 13). Twenty miles from the target, Sgt Rowlands, in DK296, felt a slight jar, then his observer found pieces of chimney-pot on his lap and a large hole in the fuselage side. When the port engine began to vibrate badly, it was throttled back to 2,300 r.p.m., and as Rowlands was unable to keep up with the formation leader he bombed some factories and turned back, feathering the port propeller when he was clear of the

coast. When he landed he discovered that the spinner and radiator had been damaged by thick cables; however, they could not have been balloon cables and the mystery remained unsolved. The hole made in the fuselage by the chimney-pot was 4 ft. long and 18 in. deep at one point, and the navigator said that when the aircraft hit the chimney he was looking down on F/Lt Hughes, the formation leader, who failed to return. The German radio claimed that a Mosquito came down near Flensburg.

On June 1 1943, 105 and 139 Squadrons joined No. 8 Group (P.F.F.), which specialised in pathfinding and target marking for Main Force squadrons. The Group already had a Mosquito bomber unit on its strength, i.e. 109 Squadron, whose aircraft, on December 21–22 1942, had pioneered the operational use of the famous target-marking and blind-bombing device known as *Oboe*, and on that historic occasion the Mosquitoes, flying at 26,000 ft. and each armed with three 500-lb. bombs, had made what was in fact an *Oboe* calibration raid on a power-station at Lutterade, in Holland. Other experimental raids had followed, and then in March 1943 the *Oboe* Mosquitoes at last gained an opportunity to lead a major attack—the sustained and crippling attack on the Ruhr.

Following its transfer to 8 Group, 105 Squadron became the second *Oboe* marker unit, and henceforth—and notwithstanding *Oboe*'s range limitations—it too made a significant contribution to the overall success of the bombing offensive.

Eventually eight more Mosquito squadrons began to operate with 8 Group and these were as follows: Nos. 128, 142, 162, 163, 571, 608, 627, and 692. All the 8 Group Mosquito squadrons were based in Bedfordshire, Cambridgeshire, Huntingdonshire, or Norfolk, but from April 1944 No. 627 was attached to 5 Group and relocated in Lincolnshire.

The Mosquito element of 8 Group was divided into two main sections, the target-marking force and the Light Night Striking Force (eventually renamed the Fast Night Striking Force). In the first category (which was of course part of the Pathfinder Force proper) were the two *Oboe* squadrons and, to some extent, 139 Squadron, which, as will presently be explained, had two major roles. The other squadrons formed the L.N.S.F., whose chief role was night nuisance bombing with the object of pinning down large forces in defence of Berlin and other key German cities and at the same time lowering the enemy's morale. During the long period of bombing of Germany by the L.N.S.F., 139 Squadron, fitted with *G-H* initially, and later *H2S*, acted as its marker squadron. Nominally it was not a pathfinder squadron, but it did in fact perform all

pathfinder duties for the benefit of the rest of the Mosquitoes.

The exploits of the pathfinder and L.N.S.F. squadrons can only be touched upon briefly in this narrative but first something about the various types of Mosquitoes which they used in addition to the original B. IV.

During 1943 de Havillands adapted the Mosquito B. IV Series II to carry a 4,000-lb. 'cookie' by bulging the fuselage belly, and in February 1944 the first of a limited number of these B. IV Specials reached 8 Group. Two were allotted first of all to 627 Squadron at Oakington, Cambs., but soon afterwards passed to 692 'Fellowship of the Bellows' Squadron at Gravelly, Hunts. It was this latter unit which first used the type to drop 'cookies' on the enemy—on the night of February, 23–24 when three B. IV Specials bombed Düsseldorf; first machine to drop its 'cookie' was DZ647 (S/Ldr S. D. Watts, R.N.Z.A.F.), at 20.45½ hrs.

Mosquito's sting. Four 500-pounders being loaded into the bomb-bay of a 105 Squadron Mosquito B. IV at Marham, December 1942. Note the bombs' cropped vanes to facilitate stowage in the 'Mossie'.



Actually preceding the B. IV Special in 8 Group was the high-flying B. IX, with 1,680 h.p. two-stage Merlin 72/73 or 76/77 engines, the prototype—first flown on March 24 1943—being a converted B. IV, DZ540. Operational ceiling of the B. IX was about 31,000 ft. outward bound and 36,000 ft. homeward bound. Two additional 500-lb. bombs were carried under the wings and some aircraft were fitted with *Oboe*. The B. IXs' first operational sortie with 8 Group* was on the night of June 11–12 1943, when LR497 'Z-Zebra', an *Oboe* machine of 109 Squadron, Wyton (Hunts.), captained by S/Ldr F. A. Green, took part in a raid on Düsseldorf. As it happened it was unable to bomb the target because its *Oboe* went u/s.

In 1944 some B. IXs were equipped with bulged bomb bays to accommodate a single 4,000-lb. bomb, but, as was also the case with the B. IV Specials, the B. IX Special suffered from stability problems and only a few examples were produced.

The great majority of B. IXs went to 8 Group's three target-marking squadrons but a few were allotted to 571 and 627 Squadrons of the L.N.S.F.

Designed to carry a 4,000-pounder from the outset was the Mosquito B. XVI, the prototype of which (MP469) flew in November 1943. This mark, with its pressure cabin and Marshall blower to permit full exploitation of its Merlin 72 engines, had an operational ceiling of 35,000 ft. First squadron deliveries of this mark were to 109 Squadron on December 19 1943, although No. 139 operated the type first, on February 10–11 1944, when F/Lt E. A. Holdaway took ML940 'O-Orange' to Berlin. First B. XVI's to drop 4,000-pounders on the enemy were No. 139's ML941 'N-Nuts' and ML942 'F-Freddy' on March 2–3 1944, when the target was München Gladbach. Thereafter a steady flow of B. XVI's reached the L.N.S.F. Six of its squadrons received the type before VE Day although only four became wholly-equipped during that period, i.e. Nos. 128, 571, 608, and 692.

Canada also built the Mosquito and from that country came the B. XX, counterpart of the B. IV Series II but with Packard Merlin 31 or 33 engines. A later wartime bomber version from Canada was the arabic mark-numbered B. 25. Between August 1943 and mid-1945, 135 B. XXs and 343 B. 25s were delivered to Britain (seventy B. 25s subsequently being handed to the Navy and four converted to carry 4,000-lb. bombs) and were used by three squadrons in 8 Group—Nos. 139, 608, and 627—and 1655 Mosquito Training Unit.

*A B. IX had previously been used operationally by 617 Squadron of 5 Group for low-level marking for the squadron's Lancasters on 5–6 April 1944.



Turning now to the activities of 8 Group's Mosquito bombers, their main roles, as mentioned earlier, were target marking and nuisance bombing. 139 Squadron did a great deal of both and one of its many notable achievements was the inauguration of operation *Ploughman*, in which aircraft made 'Siren Tours', bombing several targets on one sortie. Between February 20–21 and March 27–28 1945, it led each of thirty-six consecutive night attacks which Mosquitoes made on Berlin. The Berlin round trip of 1,200 miles took a Mosquito about four hours.

From March 1944 onwards, *Oboe* Mosquitoes of 105 and 109 Squadrons were frequently employed on daylight operations. They led the heavies which neutralised the railway network of France and the Low Countries prior to D-Day, and afterwards they led them in attacking enemy troop concentrations near Caen and flying-bomb sites in the Pas de Calais. August 27 saw them make their first daylight trip to Germany when they marked the oil-plant at Homberg in the Ruhr for some 200 heavies.

Notable night operations by 8 Group Mosquitoes included the mining, on the night of May 12–13 1944, of the Kiel Canal from very low level; and the marking for Main Force Halifaxes and Lancasters, on the eve of D-Day, of ten gun-emplacements on the Normandy coast. This latter mission, which was carried out by 105 and 109 Squadrons, proved disappointing in so far as ultimate results were concerned, but the mine-laying mission was a great success. It was the first mine-

laying mission ever attempted by Mosquitoes and was carried out by 692 Squadron, led by W/Cdr S. D. Watts, supported by nine Mosquitoes of 139 Squadron, whose task was to mark the route with green Very lights and indicate the target area with flares. Other Pathfinder 'Mossies' made a spoof attack on the lock-gates at Brunsbüttel to divert the enemy defences while 'Intruders' from 100 Group shot up gun-positions along the canal. The mine-laying force, comprising three Mosquito B. XVI's and ten B. IV's, went out with but a few hours' special training behind it, and after sweeping down from a considerable height from a point fourteen miles back, laid eleven mines 'fair and square in the canal' from heights varying between 50 and 300 ft. in a matter of minutes. The canal was defended by anti-aircraft guns and search-lights along its entire length and particularly so at each end. However, in this surprise attack opposition from defences in the mining area was slight. Only one Mosquito was shot down; a second failed to locate the target but returned safely with the rest of the force. As a result of this brilliant operation the Kiel Canal was completely closed for seven days, reopened for reduced traffic for three days, then closed for a further three. About a million metric tons of overseas cargo and 350,000 tons of coastwise cargo were held up. Twelve days later sixty ships were still held up at one end and sixteen at the other end.

8 Group's Mosquitoes remained active right up to the end of the European war, 105 and 109 Squadrons

Above and facing page: Two views of 571 Squadron's 'Cookie'-carrying B.XVI ML963, but this time showing the type's bulged bomb bay.

frequently sharing with No. 139 during the final months the task of leading the entire Mosquito force in night raids. On April 8–9 the advent of an improved type of *Oboe* enabled 105 and 109 Squadrons to visit Berlin for the first time in their pathfinder careers. They hit it many more times up to April 20–21, when bombing of the city ceased, and it was, in fact, a Mosquito of 109 Squadron (B. XVI, MM929, F.O. A. E. Austin) that was the last R.A.F. machine to bomb Berlin—at approximately 2.14 a.m. on April 21.

Final bombing operations by 8 Group's Mosquitoes came on May 2–3 when attacks were made on the town of Kiel and airfields at Husum and Eggebeck.

All told, 8 Group's Mosquito target-markers and Light Night Strikers flew 26,255 operational sorties during World War II, 108 aircraft were lost and a further eighty-eight were written off as a result of battle damage. (Figures for all Mosquito bombers operating in Bomber Command, i.e. those of 2, 5, and 8 Groups, were 28,639 bombing sorties and 110 sea-mining sorties flown, at a cost of 171 aircraft missing and a further 114 destroyed or damaged—twenty-three of them as a result of enemy action.) The total load dropped by 8 Group's Mosquitoes is known to have included about 10,000 'cookies', or 26,000 tons of

H.E., which was a truly amazing achievement for a little unarmed wooden two-man aircraft, which flew 68 per cent of its operations when heavy bombers were not operating. The Group's Mossies 'stung' Berlin on no fewer than 170 occasions between August 1943 and April 1945, sorties varying from less than half a dozen a night until a climax was reached on March 21–22 1945, with a total of 139. In the final months of the campaign their losses were down to one per 2,000 sorties—a Bomber Command record.

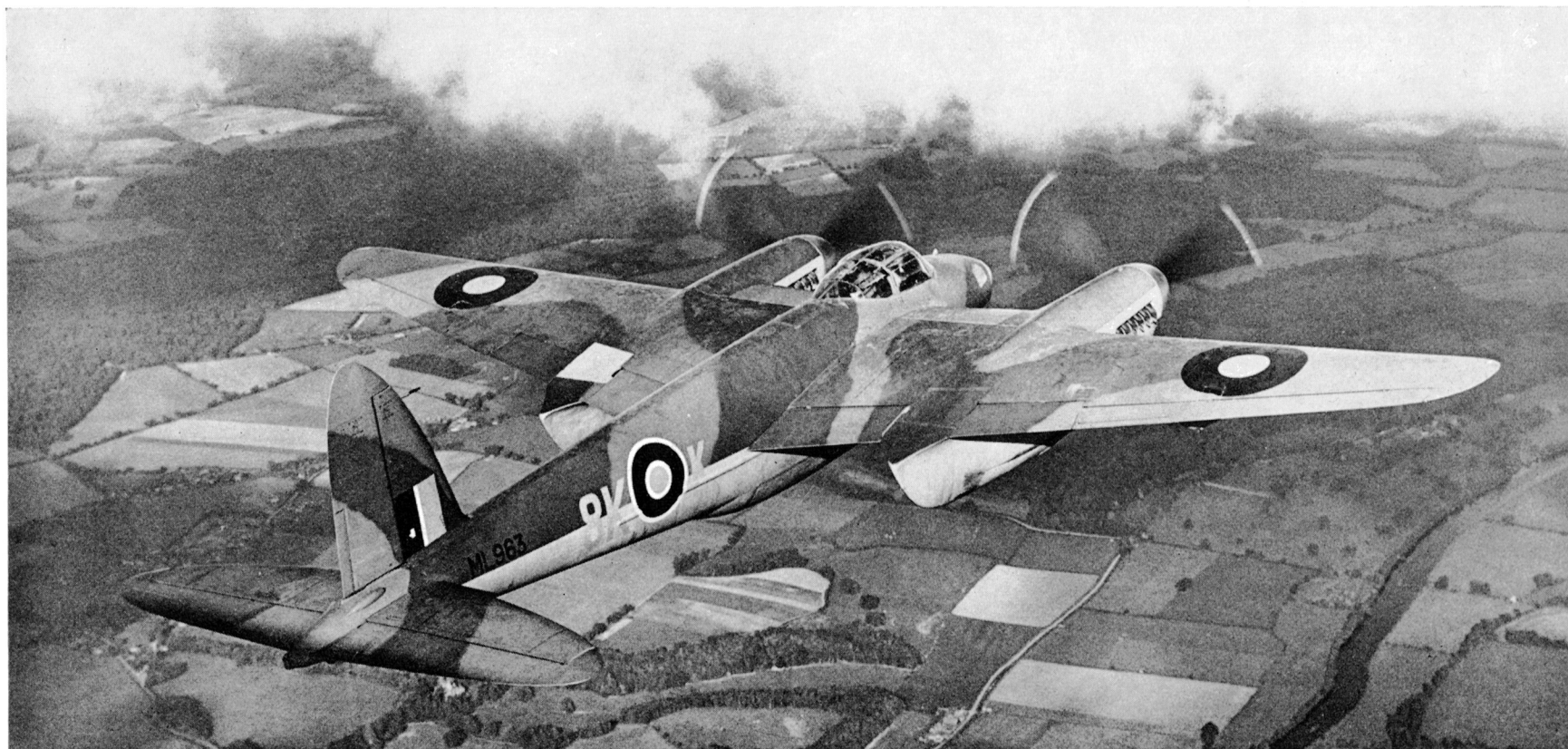
No survey of the Mosquito bomber's operational career would be complete without some mention being made of the work of 627 Squadron. Formed in 8 Group, this unit was attached to 5 Group from April 1944 and largely took over the low-level marking role pioneered by Leonard Cheshire in the few Mosquitoes operated by 617 Squadron. Unassisted by mechanical aids, 627 did for 5 Group what 8 Group's *Oboe* Mosquitoes achieved for much of Bomber Command, but whereas they relied on height and speed for safety, 627 utilised the Mossie's

manœuvrability and high speed at low levels. A mission which sums up their skill and daring was the attack on the Usine Lictard at Tours in May 1944. Several days earlier this small factory had been the target for a high altitude daylight raid by the U.S.A.A.F. and remained untouched. No. 627's Mossies marked it with ease, the only hold-up occurring when the first markers fell *through* the glass roof of the factory and almost disappeared from view!

It was while flying on operations in a Mosquito of 627 Squadron (B. XX KB267 'E-Easy') on September 19–20 1944, that W/Cdr Guy Gibson, v.c., met his death. He had acted as master bomber in a raid against Rheydt near the Ruhr (he was Base Operations Officer, No. 54 Base, at the time and had volunteered for this mission) and his aircraft crashed in Holland on the return journey, killing both himself and his navigator. Both men were subsequently buried in an unnumbered communal grave seven miles from Bergen-op-Zoom.

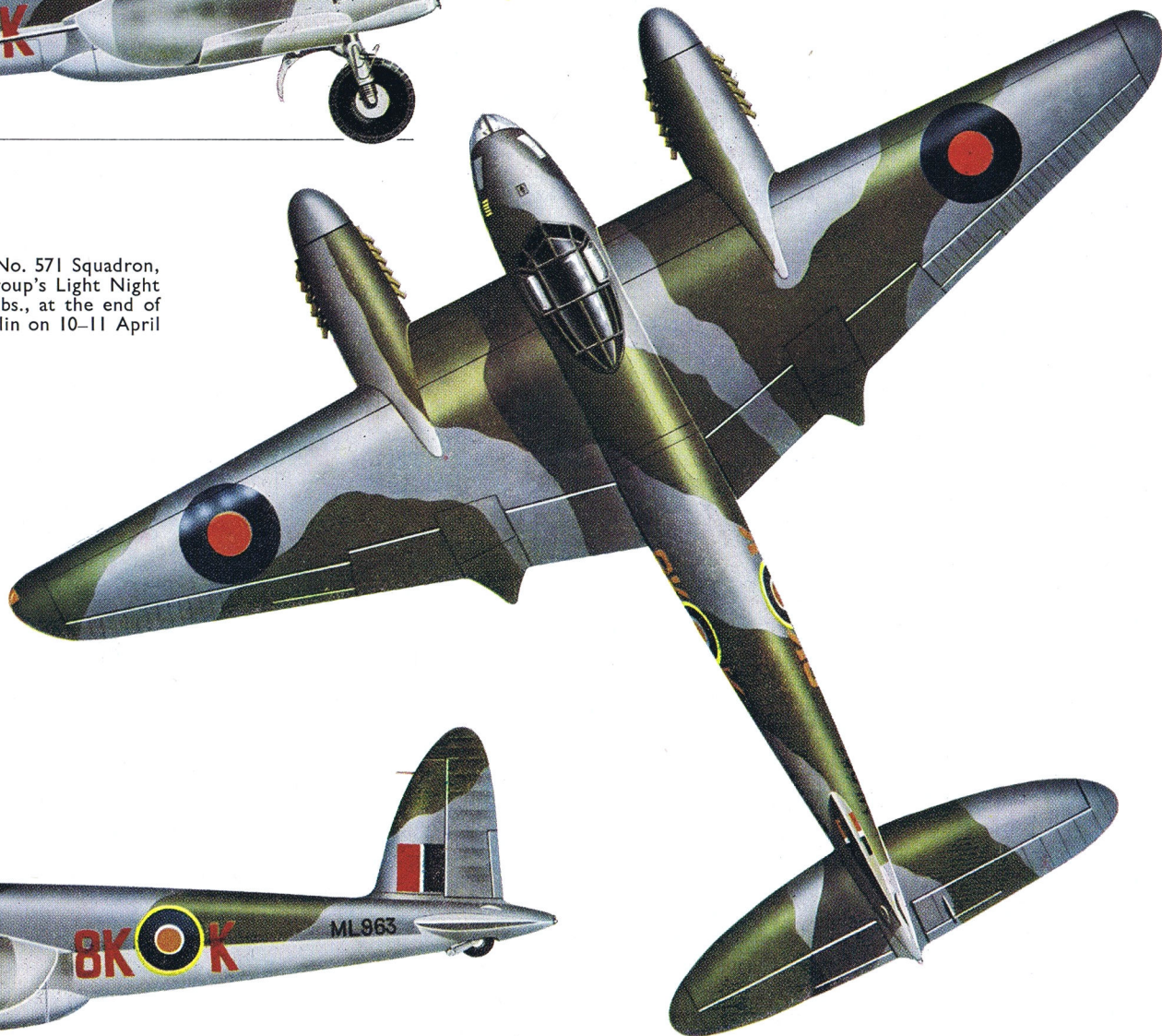
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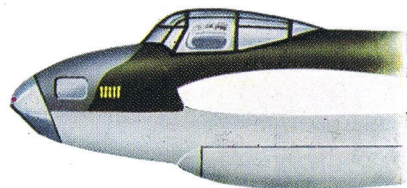
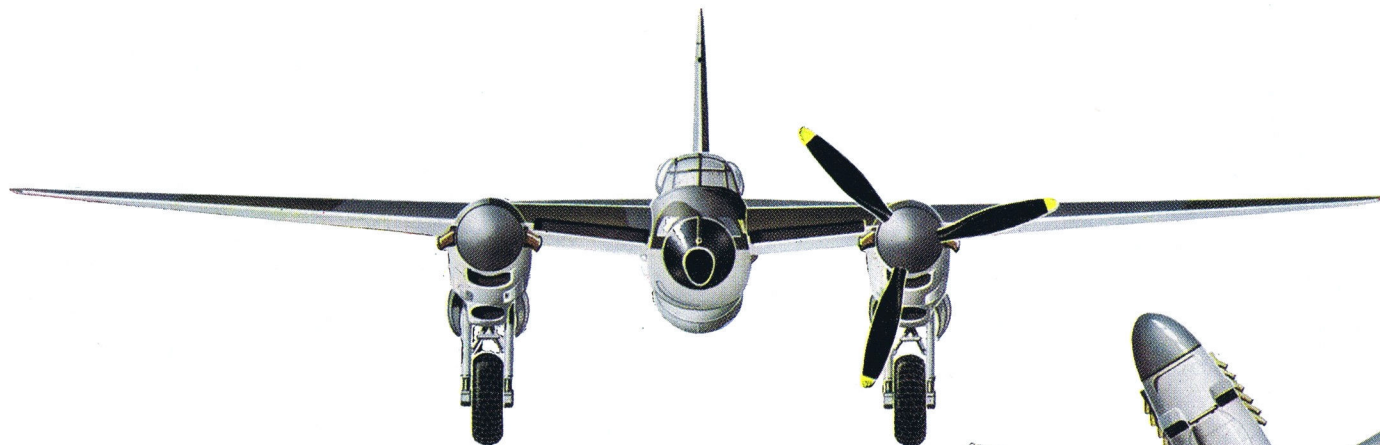
Mosquito B. IV (standard version) (B. XVI data in parentheses where different): *Crew* 2; *power plant* two 1,480 h.p. Rolls-Royce Merlin 21 or 23 (1,650 h.p. Merlin 72/73 or Merlin 76/77); *span* 54 ft. 2 in.; *length* 40 ft. 9½ in. (40 ft. 6 in.); *wing area* 454 sq. ft.; *empty weight* 13,400 lb. (14,901 lb. with large bomb bay for 4,000-lb. bomb); *loaded weight* 21,794 lb. (25,412 lb. with 4,000-lb. bomb and 25,917 lb. with 4,000-lb. bomb and 2 × 100 gal. under-wing tanks); *max. bomb load* 2,000 lb. (4,000 lb.); *max. speed* 380 m.p.h. at 14,000 ft. (408 m.p.h. at 26,000 ft. or 415 m.p.h. at 28,000 ft. depending on mark of Merlin fitted); *service ceiling* 34,000 ft. (36,000–39,000 ft.); *range* 1,620 miles with 2,000-lb. bomb load (1,795 miles with 2,000-lb. bomb load and 1,370 miles with 4,000-lb. bomb load); *armament* nil.



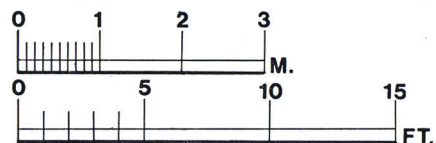


de Havilland Mosquito B.XVI, ML963, of No. 571 Squadron, a light bomber unit of No. 8 (P.F.F.) Group's Light Night Striking Force. Based at Oakington, Cambs., at the end of 1944. Failed to return from a raid on Berlin on 10-11 April 1945.

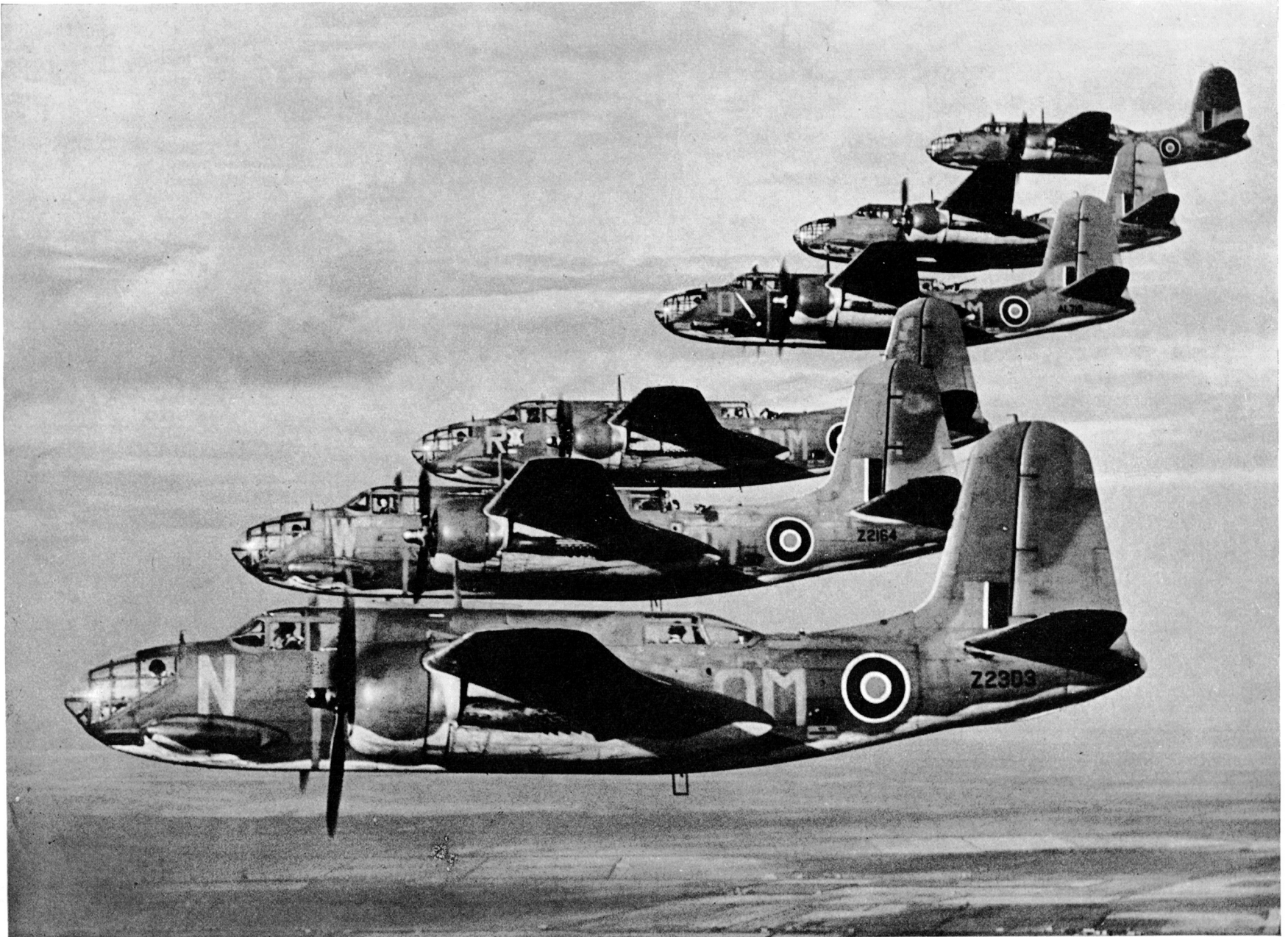




Operational sortie score on the nose
of ML963.



Douglas Boston



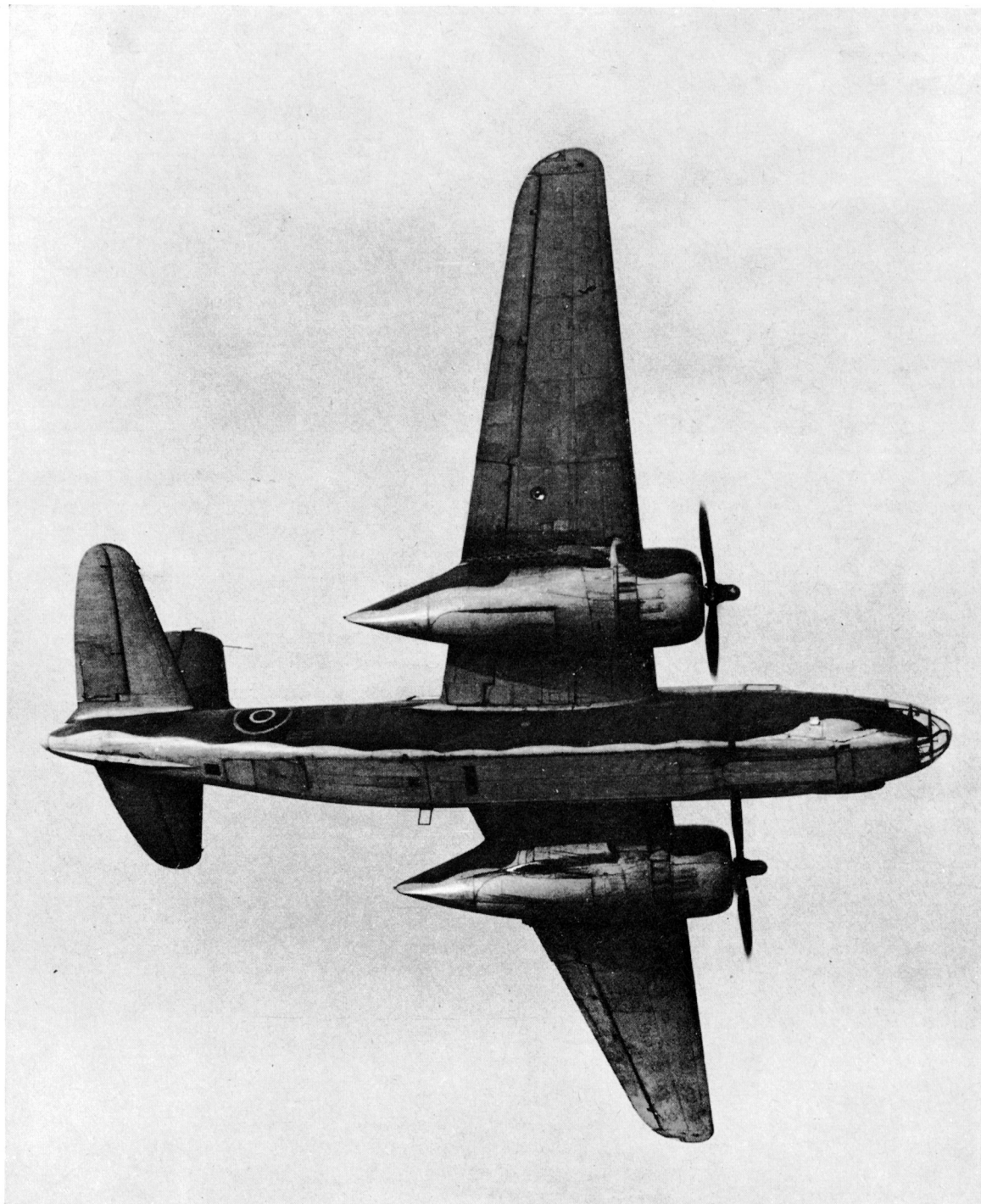
Boston III Z2179 of 107 Squadron banks steeply to port for the photographer in October 1942.

One of the best-known American aircraft used by the R.A.F. during World War II—and the first type with a tricycle undercarriage to see regular service—was the Douglas Boston which, in its later versions, was widely used by the U.S.A.A.F. in Europe as well as the R.A.F. Progenitor of the series was the Douglas Model 7B, a private-venture design, which flew on October 26 1938, and was intended to provide the U.S. Army Air Corps (as it then was) with a high-performance attack bomber. This machine crashed in January 1939 but an improved model, known as the DB (Douglas Bomber) -7, flew on August 17 1939, and initial orders were placed with Douglas by the French Air Mission (they placed their order while the machine was still on the drawing-board, in fact), with the British Air Mission of 1940 second in the queue.

Only about sixty machines reached *l'Armée de l'Air* before the French collapse in June 1940, and some of them saw action in May and June that year. The unfulfilled portion of the French contract (and possibly some Belgian orders) was later absorbed by Britain, the first machines reaching Britain in late 1940. A small original batch of DB-7s with single-stage superchargers were designated Boston Is and used for pilot training, while the much larger number of DB-7As were nearly all converted to Havoc I night-intruders by the installation of a 'solid' eight-gun nose, A.I. radar and additional armour-plating. A big snag with these ex-French contract machines was that some, if not all, of them were delivered with instruments calibrated in metric units and their controls and instruments labelled in French—all of which had to be changed.

Deliveries of the British model of the DB-7, the DB-7B (Boston III), began in the spring of 1941. This aircraft had more powerful Wright R-2600 engines in place of the Pratt and Whitney R-1830s, a larger fin and rudder, a redesigned front fuselage and longer nacelles. A few examples were converted to Havoc II standard. In addition to the Boston IIIs procured direct from the U.S.A., more Boston IIIs were acquired in the Middle East, apparently being aircraft delivered to *l'Armée de l'Air* in 1939–40. Those which entered R.A.F. service were given serial numbers prefixed 'HK', e.g. HK971, which became aircraft 'M-Mother' of 18 Squadron.

Formation of six Boston IIIs of 107 Squadron on a training sortie, October 1942. ['Aeroplane'].





107 Squadron's Boston IIIs lined up at Great Massingham for the benefit of the Press, April 1942. Note how the Boston's cockpit roof was hinged. [*'Aeroplane'*].

First squadron to equip with Boston B.IIIs, was 88 'Hong Kong' Squadron of 2 Group, Bomber Command. Before doing so it received a number of Boston Is (beginning with AW398 on December 1 1940) and 'IIIs (beginning with AE467 on March 30 1941), while based at Sydenham, Belfast. In August, when it operated Blenheim IVs from Attlebridge (Norfolk), the squadron received some non-operational Boston IIIs, its first operational Mk. IIIs arriving in October, when operations on Blenheims ceased. In November-December 1941, 226 Squadron at Wattisham was rearmed with Boston IIIs, and in February 1942, 107 Squadron at Great Massingham was similarly rearmed; like 88 Squadron both these units had previously flown Blenheim IVs. When 342 'Lorraine' Squadron, Free French Air Force, formed at West Raynham in April 1943 from what had pre-



Below and left. Mk. III AL290 'K-King' of 107 Squadron, Great Massingham, photographed in April 1942. A five-view colour painting of this machine appears on page 52. [*'Aeroplane'*].

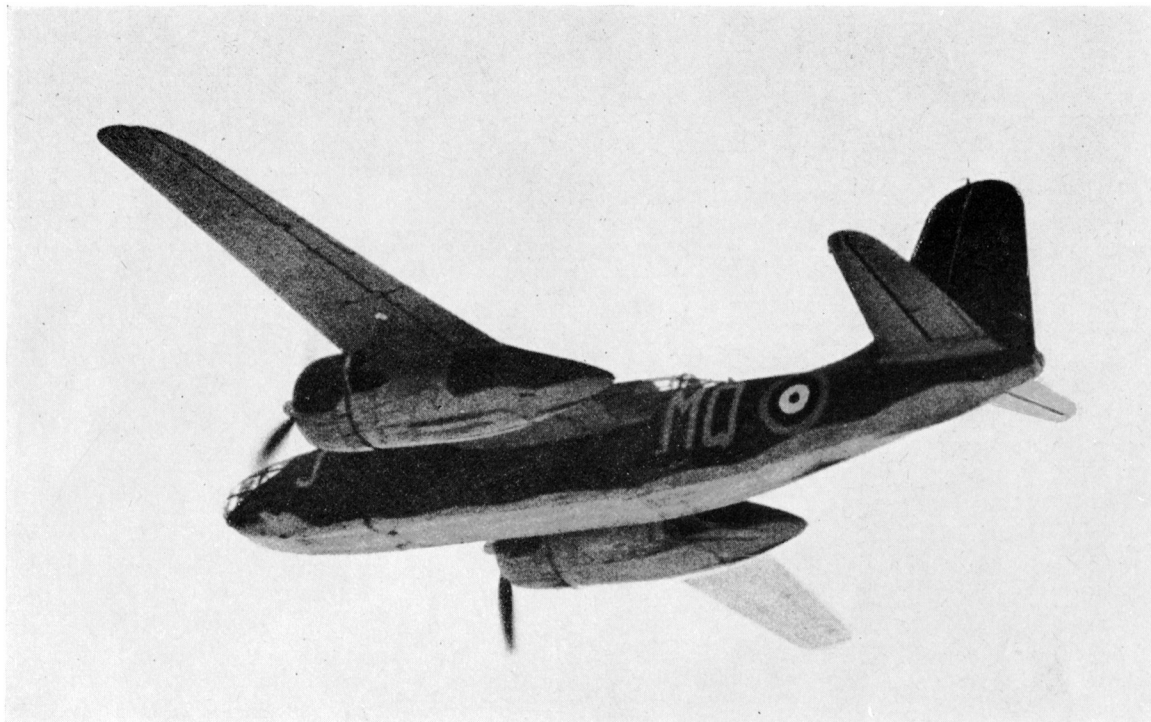


Mk. III Z2245 'J-Johnny' of 226 Squadron, Swanton Morley (Norfolk), circa March 1942. On June 25 1942 this unit provided the basis for the first operational action by the U.S.A.A.F. in Europe, when a four-man crew from the 15th Bombardment Squadron (Separate) flew one of 226's Bostons on a sortie against Hazebrouk marshalling-yards in Northern France. ['Aeroplane'].

viously been known merely as the Lorraine Squadron, F.F.A.F., it too was armed with Bostons—Mk. IIIs, the Lease-Lend version of the Mk. III, from which latter it could be distinguished by the stub exhausts in place of the single long exhausts with flame-traps. In August and September 1943, 88, 107, and 342 Squadrons moved to Hartford Bridge (later renamed Blackbushe) as 137 Wing, Second Tactical Air Force, 226 Squadron having rearmed with Mitchells. The Boston IIIs had gradually been replaced in 88 and 107 Squadrons by Mk. IIIs during the first half of the year, some of the Mk. IIIs being sent to the Middle East. By mid-1944 some Boston IVs (A-20Js) were in the squadrons, these Lease-Lend machines having a one-piece Perspex nose and a Martin two-gun dorsal turret. In October 1944, 137 Wing comprising now 88 and 342 Boston Squadrons and 226 on Mitchells, moved to Vitry-en-Artois, France. 88 Squadron disbanded there in April 1945 and at the same time the other two squadrons moved to Gilze-Rijen (Airfield B.77), Holland.

First occasion when Boston IIIs were used operationally was February 12 1942, when ten machines of 88 and 226 Squadrons took part in the armed search for the German warships *Scharnhorst* and *Gneisenau*, which had escaped from Brest and proceeded up the Channel. Only one machine—from 226 Squadron—managed to find a target and deliver an attack. Bostons made their first attack on a land objective on March 8 1942, when aircraft of 88 and 226 Squadrons made a low-level raid on Matford Works at Poissy, while others from the same units took part in a diversionary *Circus* operation against a power-station at Comines. The Boston which led the Matford mission—Z2209 'G-George', captained by 226's C.O., W/Cdr V. S. Butler—was lost on the return journey. It was damaged either by light flak or bomb-blast, and when a few miles from the target it was seen to be in difficulties; it struck a tree with its port wing, stood on its tail in a vain attempt to clear more trees, and then crashed. The rest of the force returned safely.

Daylight *Circus* operations formed a large part of the Boston's early activities over Europe, their purpose being to bring the *Luftwaffe* to battle. They were flown either at low or medium level and the targets, in addition to power-stations, included airfields, marshal-



Boston IIIs of 88 Squadron, Attlebridge (Norfolk) flying in box-of-six formation, circa May 1942.





Boston III, AL754 'D-Dog' of 107 Squadron, photographed in October 1942. On December 6 1942 this particular machine was wrecked in a crash at Great Massingham (Norfolk) on its return from a sortie against the Philips radio and valve factory at Eindhoven, Holland.

ling-yards, and ports. The Bostons also flew unescorted missions, diving out of cloud to attack their objectives and returning to such cover for the homeward flight. On August 17 1942, during the commando raid on Dieppe, they did valuable work in laying smoke-screens to cover both the assault and withdrawal. Another special operation came in December when they led the famous raid on the Philips radio and valve factory at Eindhoven in Holland. Towards the end of 1943, 137 Wing's Bostons joined the assault against the German V-1 depots and sites in northern France, and when D-Day finally came they repeated what they had done at Dieppe and laid smoke-screens over the beaches. After this the Bostons operated in close support of the advancing Allied Armies on the Continent, eventually winding up their offensive with a series of attacks launched from their base in Holland on targets in western Germany.

(Note: Boston IIIs were also used by the U.K.-based 23, 418 (R.C.A.F.) and 605 Squadrons during the period 1942-3, and although these units did do some bombing, they were essentially fighter-intruder units and therefore they are outside the scope of this survey.)

In the spring of 1943, 326 Wing, Tactical Bomber Force, in North Africa, comprising 18 'Burma' and 114 'Hong Kong' Squadrons, relinquished the Bisleys which it had been operating and converted to Boston IIIs (later supplemented by Mk. IIIAs) which it first took into action in close-support of the ground-forces during the closing stages of the Tunisian campaign. Like their U.K.-based counterparts, the squadrons adopted the 'box-of-six' bombing technique and usually operated with a fighter escort.

The North African campaign over, the squadrons turned their attention to the enemy-held islands of

The navigator and bomb-aimer (he doubled both jobs) at his bomb-sight in the nose of a Boston III. On operations all the crews, except the ventral gunner, often wore steel helmets because it was found that many flak bursts came above the aircraft and shrapnel tore through the roof.



Pantellaria, Lampedusa, and Sicily, stepping-stones to Italy, and then bombed targets in Italy itself, moving across *via* Sicily to the Italian mainland in the wake of the advancing Allied Armies. Day and night missions were flown during this period—the Bostons sometimes acting as pathfinders—and by late 1944 there were four R.A.F. Boston squadrons operating in Italy, the newcomers being 13 and 55 Squadrons, both of which converted to Boston IVs from Baltimores. The four Boston squadrons formed 232 Wing of Mediterranean Allied Tactical Air Force, their crews, because of their night-flying role, becoming known as ‘Pippos’, a contraction of *pipistrello* (bat), and a word which, in the singular, was the name of a comic character, cf. ‘batty’. 13 Squadron claims to have introduced the ‘Balbo’ bombing technique in which one aircraft marked the target with flares and incendiaries for others to bomb at half-second intervals.

Night armed reconnaissance was the major role of the Bostons during the Italian campaign, and in December 1944, when 18 and 114 Squadrons operated in this role over the Fifth Army front, they drew praise from General Mark Clark, the Fifth Army’s C.-in-C. He said that their work was invaluable to his Army, which would otherwise have remained ignorant of the enemy’s movements during the hours of darkness. Tactical Air Force went so far as to say that the work of six Bostons during the night was more valuable than an entire wing of day-bombers.

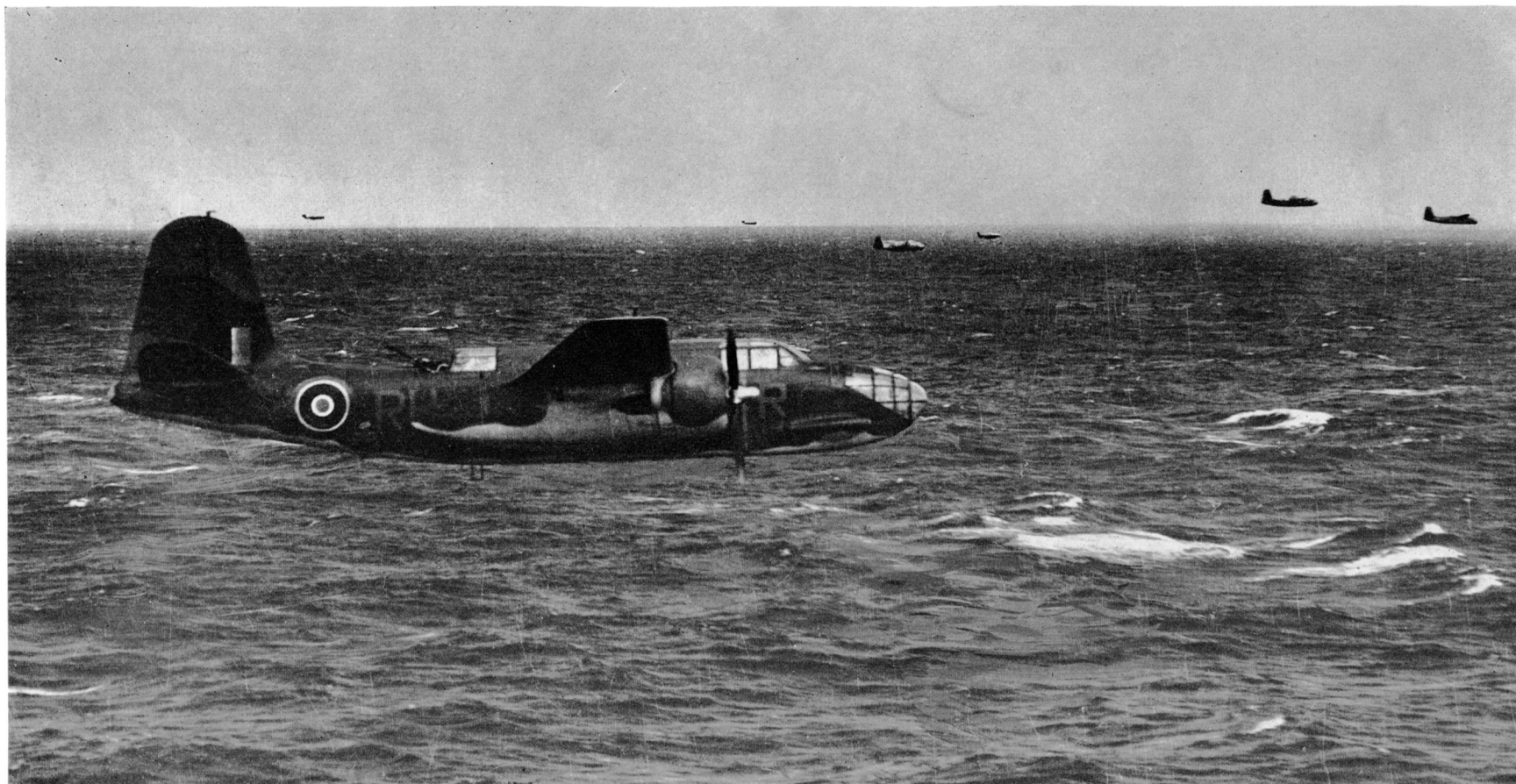
During April 1945, all four Boston squadrons—they were now flying Mk. IVs and Vs*—made night attacks in support of the Eighth Army’s final assault which was to defeat the German forces in

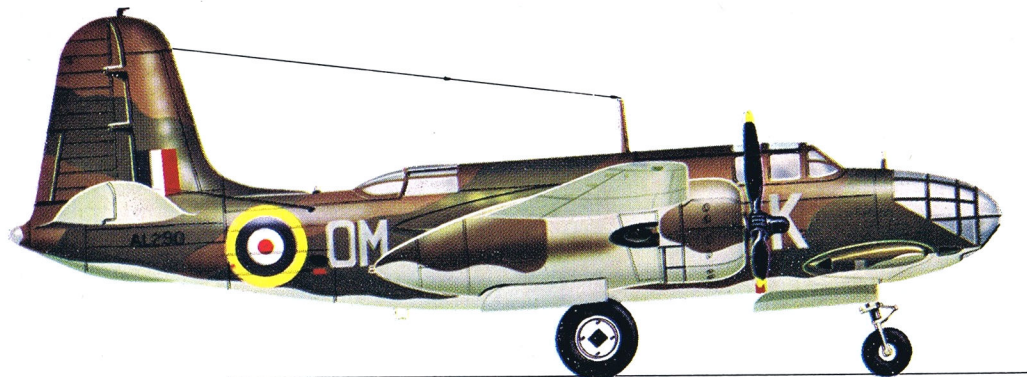
** The Mk. V was the R.A.F. version of the A-20K and was generally similar to the Mk. IV but had a revised cockpit for more accessible bombing controls.*

Italy. Most of this bombing was done on timed runs from the Army’s landmark beacons, the principal targets being gun-positions, strong points, M.T. and pontoon and ferry crossings over rivers. Final operational task of the Bostons was the dropping of surrender leaflets to a force of Germans still holding out north of Gemona, on May 4 and 5.

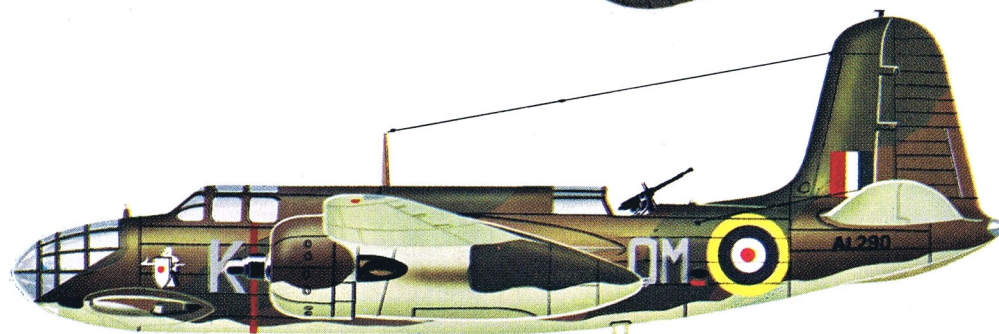
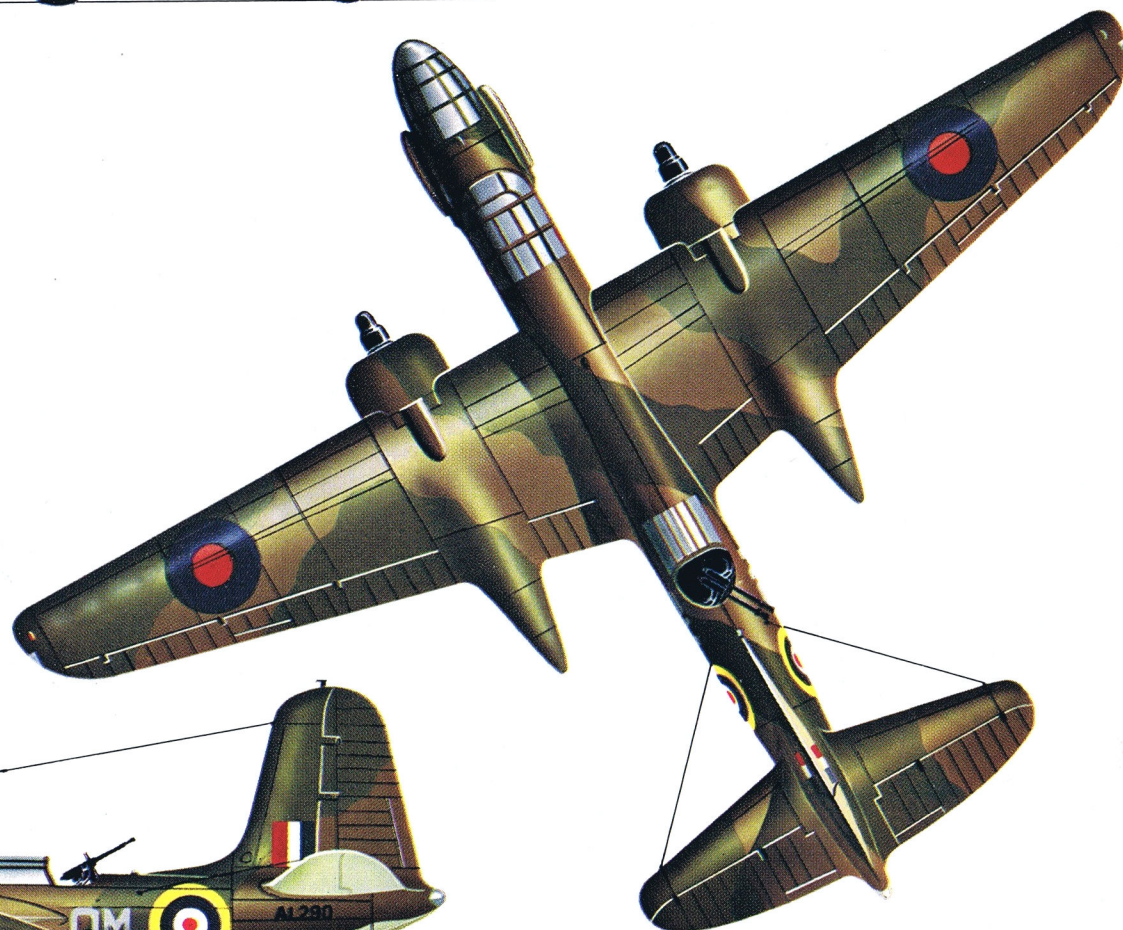
After the cessation of hostilities all Lease-Lend Bostons were returned to the U.S. Government, which then reduced them to scrap, as it also did with most other returned Lease-Lend types.

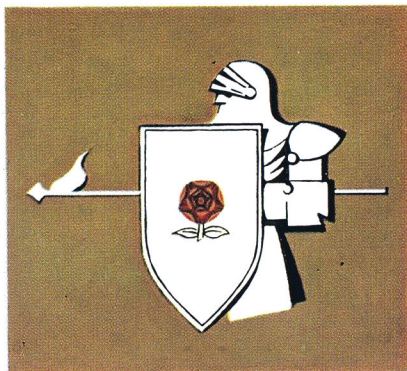
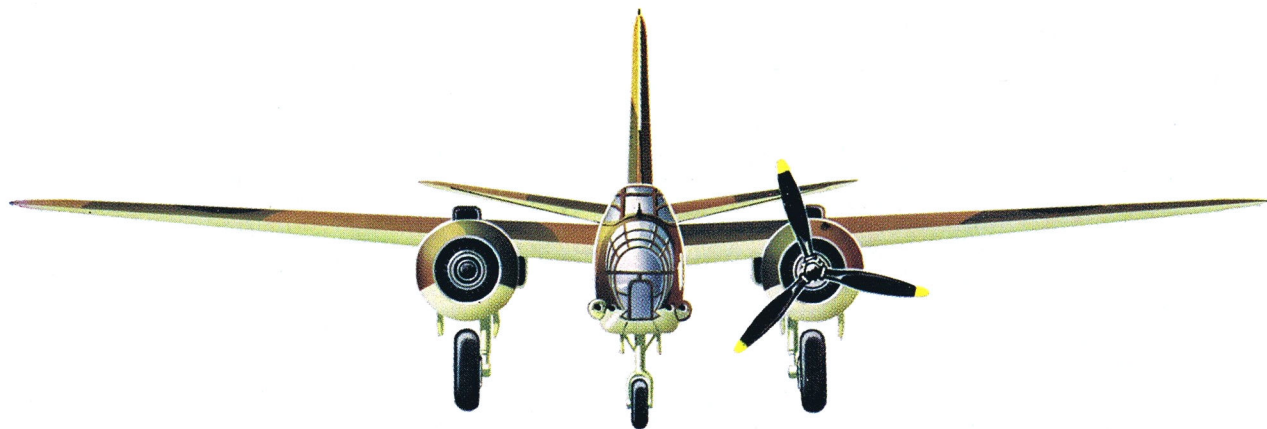
Boston IIIs crossing the sea at low level en route for enemy territory in late 1942. The machine in the foreground sports the code letters ‘RH’ denoting 88 Squadron. [Imperial War Museum.]



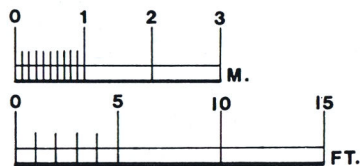
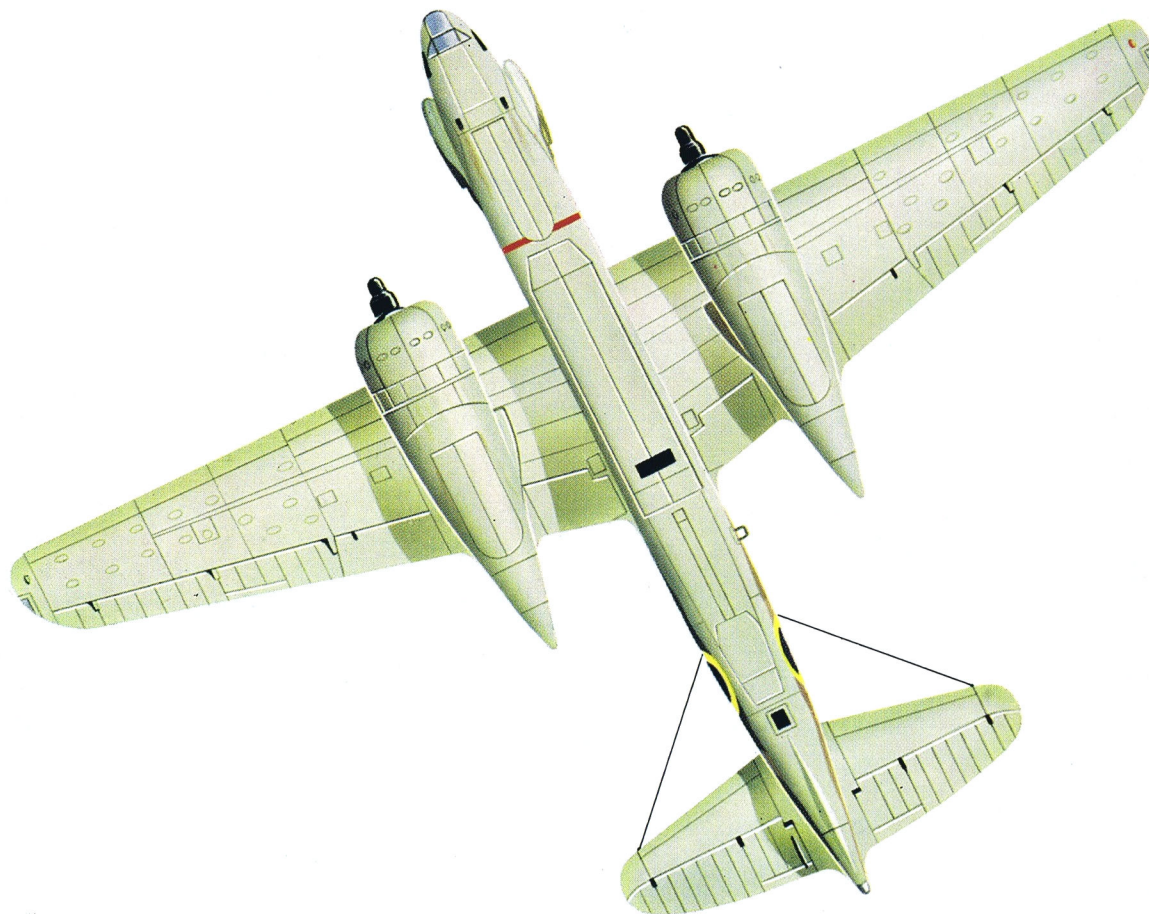


Douglas Boston III, AL290, of No. 107 (B) Squadron. Based at Great Massingham, Norfolk, in April 1942.





'White Knight' nose insignia on AL290.



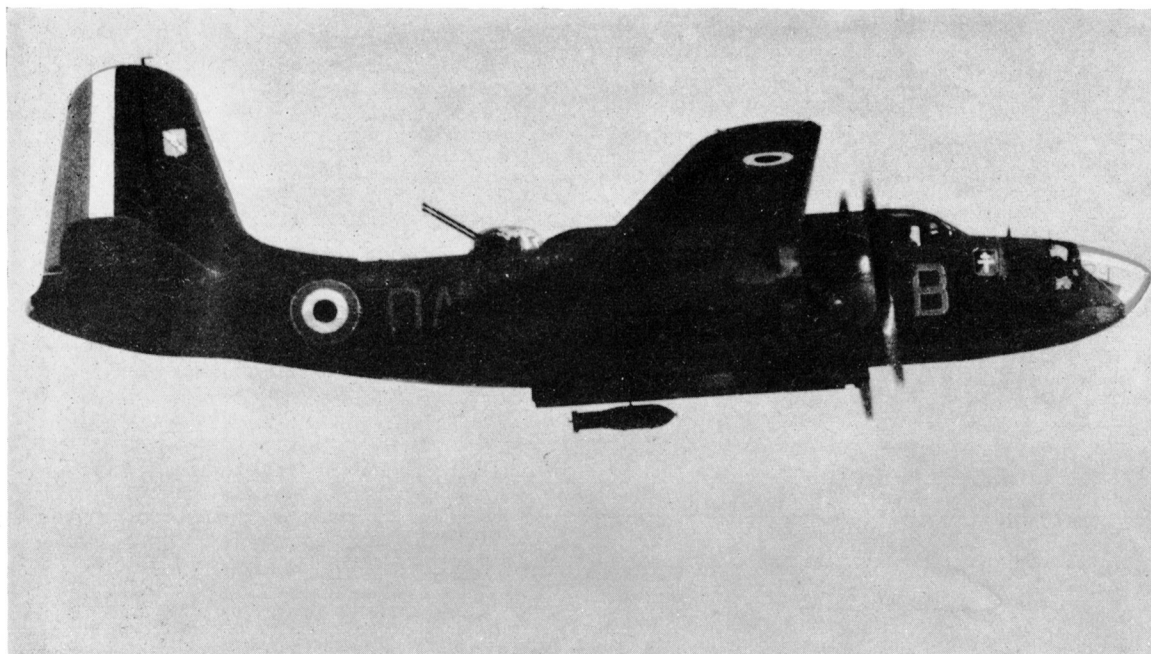
Specification

Boston III: *Crew 4; power plant two Wright Double Cyclone R-2600-A5B, 1,700 h.p. at 3,500 ft.; span 16 ft. 4 in.; length 47 ft. 6 in.; wing area 465 sq. ft.; empty weight 12,200 lb.; max. loaded weight 25,000 lb.; max. bomb load 2,000 lb.; max. speed 320 m.p.h. at 11,000 ft.; service ceiling 24,500 ft.; range 1,240 miles with max. bomb load; armament four fixed .303 in. m.g. in nose, twin .303 in. m.g. in dorsal and ventral positions.*



Boston Mk. IIIA BZ377 'F-Freddy' of 88 Squadron. No. 88 first used this mark operationally in April 1943, the last of its Mk. IIIs being withdrawn during the following month. Built by Boeing, the Mk. IIIA differed from the earlier model in having, among other things, a revised electrical system and lengthened carburettor air intakes incorporating tropical filters.

Below: Boston IV BZ443 'B-Baker' of 342 'Lorraine' Squadron, F.F.A.F., in action over enemy territory in 1945.



A French ground-mechanic adds another sortie to a Boston III of 342 'Lorraine' Squadron, Hartford Bridge (now Blackbushe) Hants., after the Free-French air crew had brought it back from a pre-invasion mission against Hitler's West Wall in May 1944.



Fairey Battle

The story of the Fairey Battle light day-bomber is the story of a once seemingly promising aircraft which, when put to the test of war, failed tragically to perform its task. A large yet gracefully slender machine, it was handicapped by being almost as big as a Blenheim, yet with the engine power of the Hurricane, i.e. one Rolls-Royce Merlin; it was virtually defenceless from the rear and its speed quite insufficient for

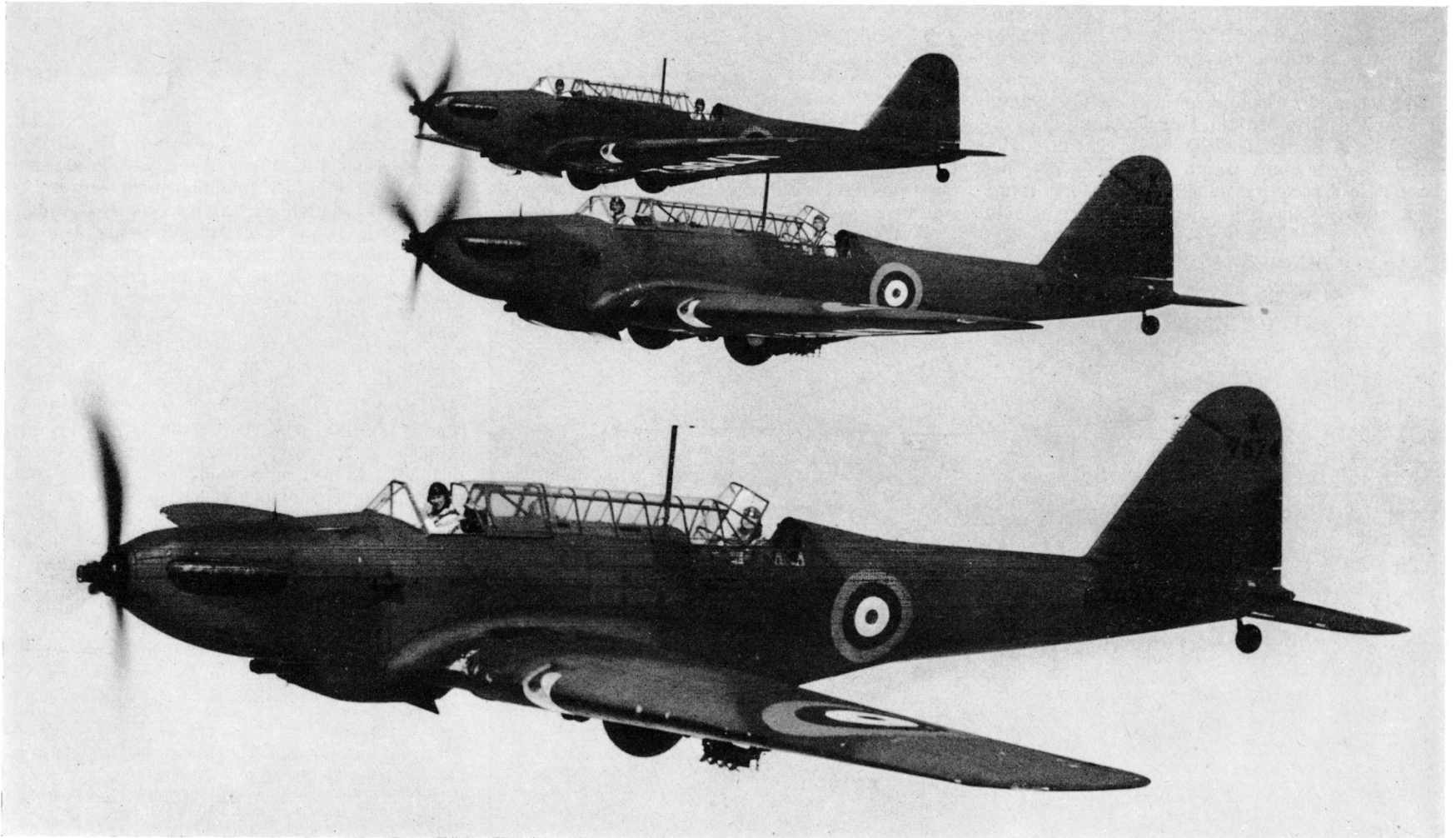
evasion when attacked by fighters or exposed to accurate ground-fire.

However, at the time when the prototype appeared—in 1936—its speed performance (257 m.p.h.) was far in advance of any contemporary day-bomber; indeed, early production models, when pitted against contemporary fighters during the air exercises of August 1937, were almost unopposable. To catch the

low-flying Battles, Gladiator pilots opened their throttles far beyond the permissible limit when flying near the ground and risked wrecking their engines in doing so.

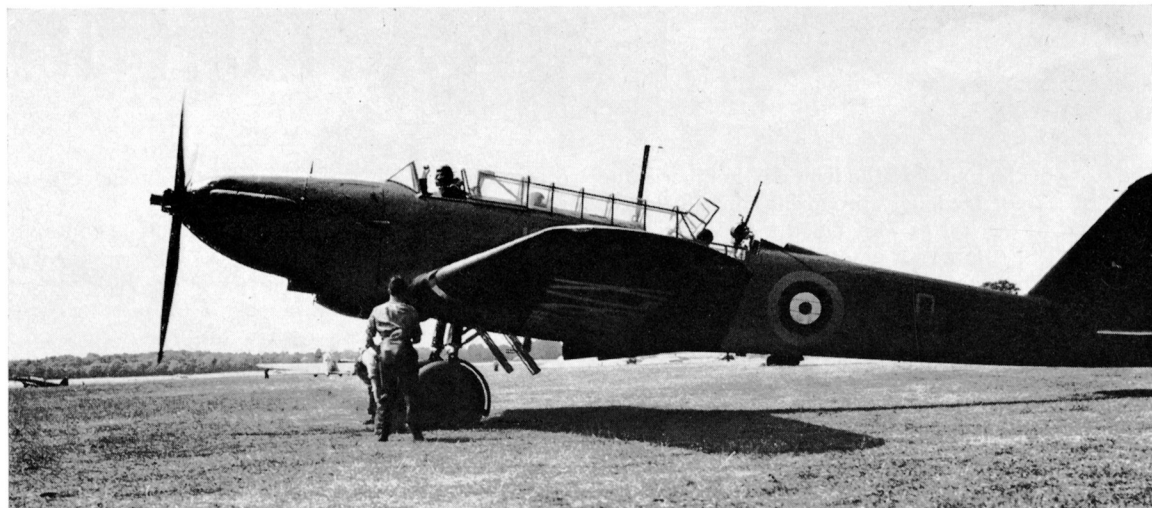
The prototype Battle (K4303) was designed by Marcel Lobelle to meet an Air Ministry Specification of April 1933, which called for an experimental two-seat single-engined monoplane day-bomber capable of carrying 1,000 lb. of bombs for 1,000 miles at 200 m.p.h. By the time the production model flew (June 1937) the Hawker Hind was the mainstay of

*Three machines of 12 Squadron, Andover (Hants), early 1938. [*Flight International*].*

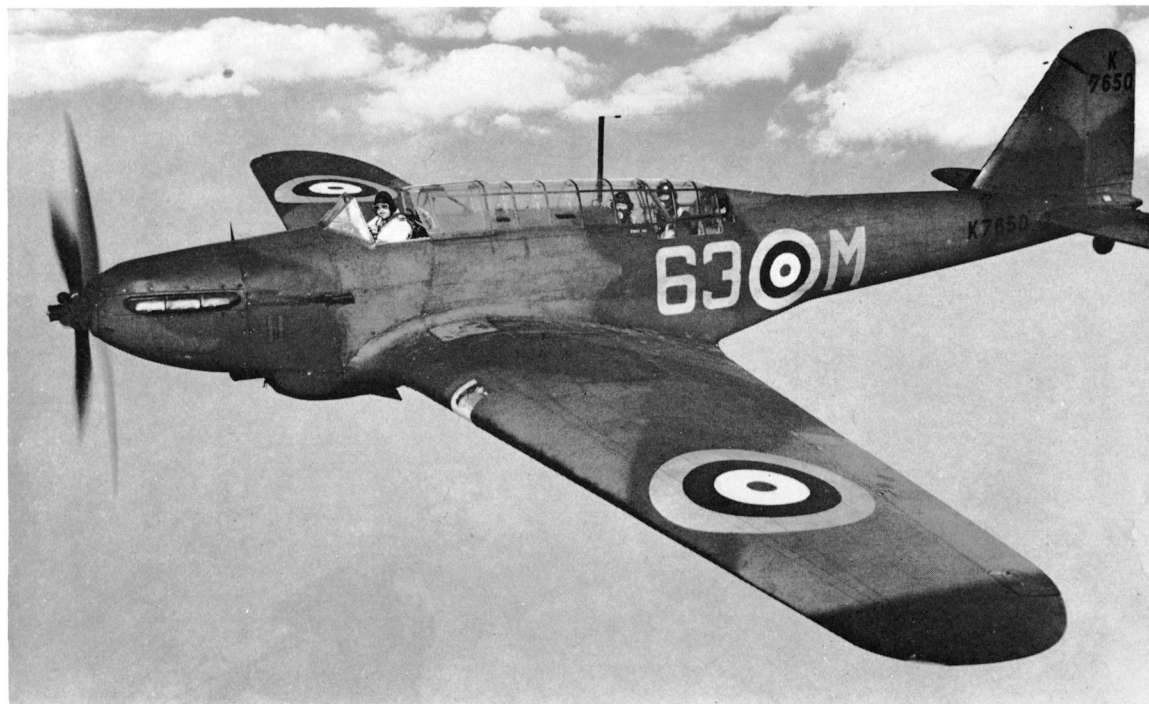


K7622 'Q-Queenie' of 105 Squadron, Harwell (Berks.), in 1938, carrying on its fin the unit's badge—a battle-axe (inspired by the Battle aircraft) with an emerald green handle to commemorate No. 105's post-1914–18 war service in Ireland. ['Aeroplane']

Britain's day-bomber squadrons and it was this machine, the last of the R.A.F.'s biplane light bombers, that the Battle helped to replace in front-line service. By then, though, some (if not all) of the Air Staff had reached the conclusion that the light bomber was outmoded on the score of insufficient range and bomb load to attack the obvious enemy, Germany. However, the pressure for immediate expansion of the R.A.F.'s first-line strength so as to maintain at least numerical parity with the *Luftwaffe* had become irresistible, and the Battle went into large-scale production. Under the threat of the Third Reich 2,185 Battles were built in Britain—almost half of them by Austin Motors at Longbridge under the shadow-factory scheme by which Blenheims were also built in large (and, as it turned out, largely useless) numbers by Rootes at Speke. The Battle was patently obsolescent many months before war broke out, but because of the need to maintain existing labour forces intact and difficulties in getting other types into



production to take its place, it was kept in production. Thus it was that this light bomber was destined, to a large extent, to become just another of the redundant types which sat in hundreds, 'watching the grass grow beneath them', on war-time dispersal airfields.



The initial Battles—Mk. Is—were fitted with Rolls-Royce Merlin I engines. Later, Merlin IIs, IIIs, and in some cases Mk. IVs and Vs, were installed in Battles, and in order to differentiate between the variants, the aircraft were retrospectively designated Mk. II, III, IV, and V according to power plant.

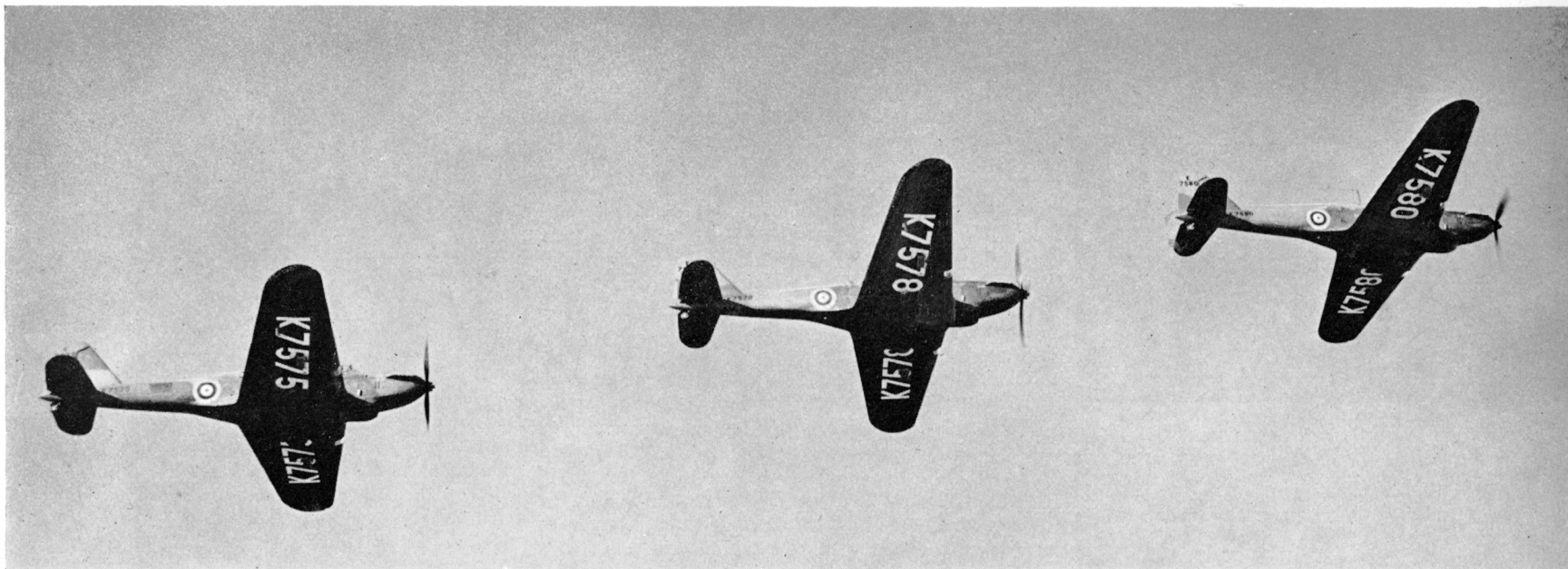
Although basically a two-seater, the Battle also provided accommodation for a third crew member—a wireless operator/air-gunner. Armament consisted initially of a Browning gun in the starboard wing, and a Vickers K gun on a free mounting in the rear cockpit.

Most Battles were built as bombers, but the total British production figure of 2,185 included 226 target tugs (Battle T.T. Mk. Is) and 100 dual-control trainers (Battle Ts). Several machines built as bombers were subsequently converted to these non-operational roles. In addition to the British production, eighteen Battles were built in Belgium for the Belgian Air Force.

First R.A.F. squadron to be equipped with Battles was No. 63, based at Andover. It received its first machine (K7559) on May 20 1937, and by the year's end had fifteen on charge. Nos. 105, 226, 52, and 88 Squadrons—in that order—also received Battles in 1937, and it is of passing interest that 105 Squadron's link with the type is commemorated in the unit's badge—a battle axe, with the motto 'Valiant in Battles'.

By May 1939 a total of seventeen Battle squadrons

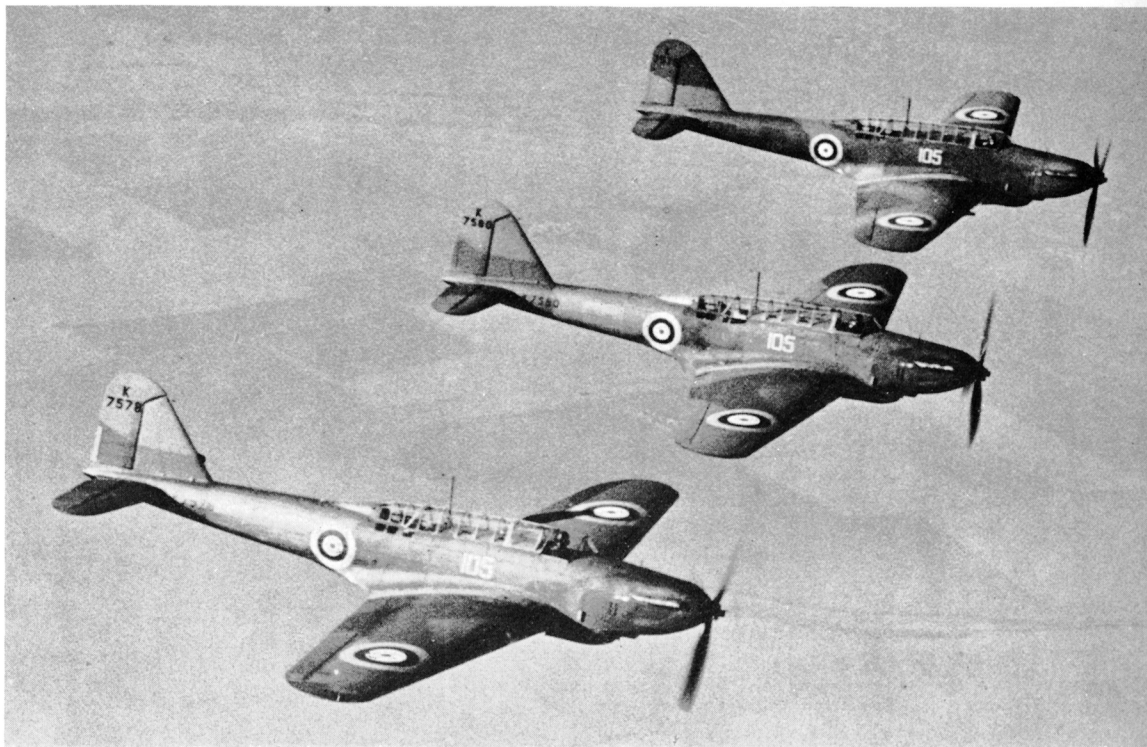
K7650 of Squadron, Upwood (Hunts), early in 1938. The darkened wing-tip is due to a shadow being cast by the photographic aircraft. No. 63 was the first unit to be equipped with Battles, its first machine (K7559) being received on May 20 1937. [Charles E. Brown]



Three machines of 105 Squadron (K7578, K7580, and K7575) flying in line-astern and line-abreast formation in 1938. ['Aeroplane'*].*

was in being, and these were serving in Nos. 1, 2, and 5 Groups of Bomber Command, No. 1 Group being an homogeneous Battle Group. The 2 Group Battle squadrons assumed a non-mobilising role, and in September 1939 they were transferred to 6 (Training) Group of Bomber Command and made into Group Pool squadrons (i.e. operational training units) or, in the case of 98 Squadron, a reserve squadron. It was from the No. 6 Group pool squadrons that some of the first big wartime Operational Training Units were formed in the spring of 1940. Apropos what has already been said about the continued production of the Battle after it was patently obsolescent, the position by the outbreak of war was that no less than 1,014 were already on charge (179 had already been struck off for various reasons); it was the second most numerous type on charge, pride of place going to the Blenheim (1,089).

When war seemed inevitable, the ten mobilising Battle squadrons of 1 Group were the first British aircraft to arrive in France. They formed the first echelon of the Advanced Air Striking Force (A.A.S.F.) flying on September 2 1939 to previously selected airfields and landing-grounds in the heart of the champagne country (as arranged during pre-war Anglo-





Production scene at Fairey's Heaton Chapel (Stockport) factory in April 1939. Although the Battle was clearly obsolescent by this time, it was kept in production until 1940 because of the need to maintain existing labour forces intact and difficulties in getting other types into production to take its place. ['Aeroplane']

French Staff conferences) to await the arrival, some days later, of their ground-crews. The idea behind the despatch of the A.A.S.F. to France was that, should the Germans begin bombing, the Battles could retaliate on Ruhr targets at closer range than from Britain. At first the A.A.S.F. remained under Bomber Command's control.

One Battle (from 40 Squadron) ditched in the English Channel *en route* to France owing to engine failure, but the crew were rescued. Some of the landing-grounds in France were no more than small, recently harvested cornfields surrounded by woods. The aircraft were quickly dispersed about their landing-grounds and hidden among trees or under camouflage nets; armour was fitted and all unauthorised markings, such as under-wing serial numbers, obliterated.

As things turned out, both the Allies and the Germans refrained from starting any unrestricted bombing offensive, and this phase became known as the 'phoney' war. The Battles were employed on day-light reconnaissance ten to twenty miles over the Franco-German border, but not without suffering losses. On September 20 three Battles from 88 Squadron (Mourmelon-le-Grand) were intercepted by enemy fighters during a patrol and two of them were shot down. However, the score was partly levelled: for Sgt F. Letchford, air-gunner in another Battle (K9243), destroyed a Messerschmitt Bf. 109; this was the R.A.F.'s first air combat 'kill' of World War II. Exactly a week later, on September 27, three Battles

from 'A' Flight of 103 Squadron (Challerange, one of the most forward A.A.S.F. bases, near Verdun) were reconnoitring the frontier between Bouzonville and the Rhine at 3,000 ft. when they were attacked by three French Curtiss Hawks which came out of a cloud. The formation leader, F/Lt M. C. Wells, fired his recognition lights and brought his flight down until it was flying close to the ground. After the first attack the French aircraft broke away, presumably having identified the Battles. At this point the Battles were engaged by three Bf. 109s which suddenly appeared 'out of the blue'. Sgt Vickers, navigator of Battle K9271, flown by V. O. Vipan, was badly wounded and in great pain, and so Vipan, whose engine was already failing, forced-landed in a field. On the way down, apparently, one of the enemy fighters presented itself as a sitting target, and the air-gunner sent it down in a spin to equal the score. Vipan landed, on one wheel, in a field close to a Maginot Line fort, and saw a French *poilu* running towards him, shouting in Cockney: 'Blimey, Guv'nor, you're bloody lucky.' The wounded navigator was removed from the aircraft, and the Frenchman then explained his Cockney accent and command of English bad language by saying that he had lived in Chelsea. Later, more French soldiers arrived and, pointing to a dense column of smoke from a nearby wood, said that was the Messerschmitt which Vipan's gunner had brought down with them. A French report later confirmed this. Vipan's navigator, Sgt Vickers, subsequently died in hospital as a result of his wounds, but just before he died he was

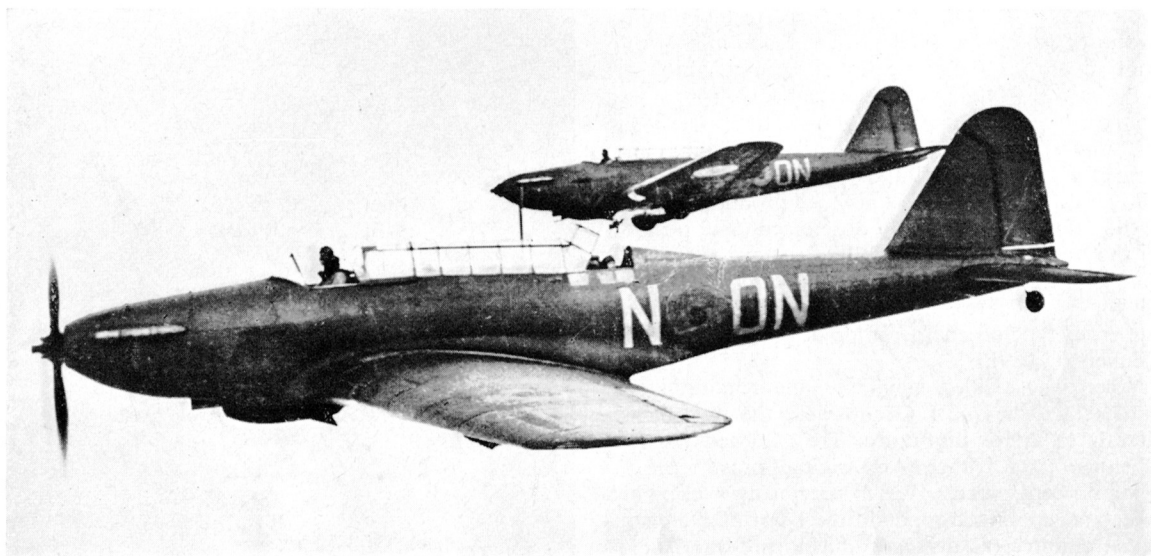


250-pound general-purpose bombs being winched up into the bomb-cells of a Battle Trainer. Note the external underwing racks for light bombs or flares.

awarded the *Medaille Militaire* by order of General Gamelin, the French Generalissimo. This was the first French decoration awarded to the B.E.F. in World War II.

Three days after this incident involving 103 Squadron, five Battles of 150 Squadron (Ecury-sur-Coole), after having crossed the frontier above 20,000 ft. to reconnoitre a strongly defended position in the Saar, were 'jumped' by fifteen Bf. 109s. The enemy attacked in flights, with anti-aircraft fire 'filling in'

Two Battles of 63 Squadron in pre-war but post-Munich crisis markings. Roundels have been darkened. [S/Ldr F. E. Dymond.



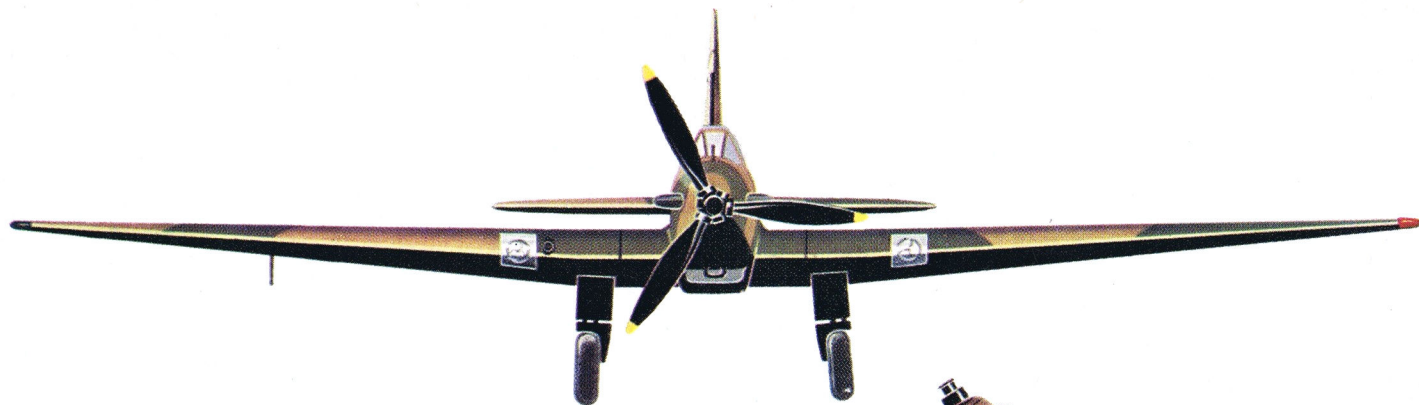


Battle K9244 of 88 Squadron, Advanced Air Striking Force, runs up its engine on the snow-covered airfield at Mourmelon-le-Grand, France, during the first winter of the war. When the Battle of France began on May 10 1940, there were more than 100 Battles serviceable in the A.A.S.F., but within a matter of a few days, after a series of gallant and bloody actions, the wrecks of a great many of them lay strewn about the valleys of the Ardennes. [Imperial War Museum.

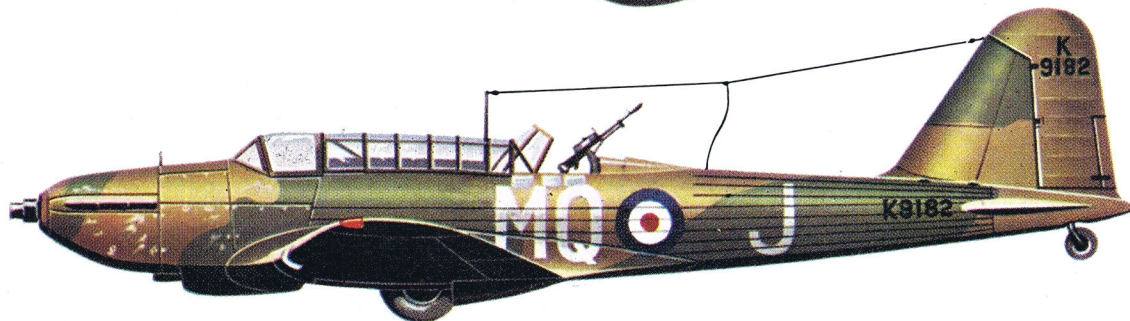
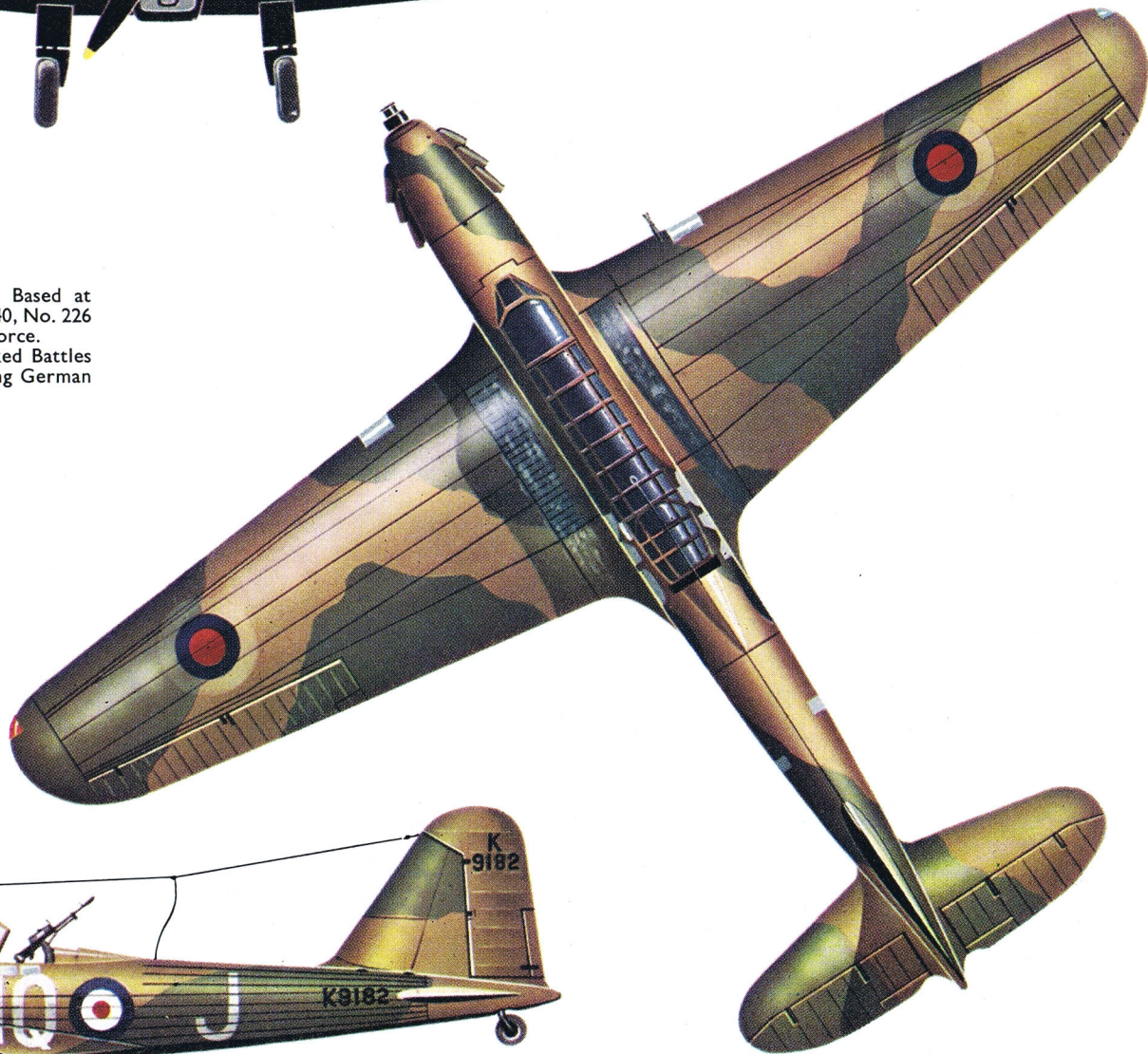
between attacks. The '109s broke their formations and attacked the Battles from astern, zooming up underneath. The fight continued for thirty-five minutes and three Battles were shot down, while a fourth forced-landed. Eight men (out of the twelve aboard the four machines) baled out. S/Ldr W. M. L. Macdonald, leader of the formation, pressed on alone, 'jinking' continuously while his gunner fired from the rear to drive off the attackers. The nearest Messerschmitt, hit in the engine, fell in flames. The second one spun down, trailing black smoke. At this juncture the other '109s withdrew. The lone Battle (K9283) was struck by eighty bullets and was in a very sorry state: its ailerons and rudder were damaged, both petrol-tanks were holed and flooding the cockpit, the undercarriage was jammed half-down, and the port tyre was punctured by bullets; the navigator's instruments were smashed and his head grazed by a bullet,

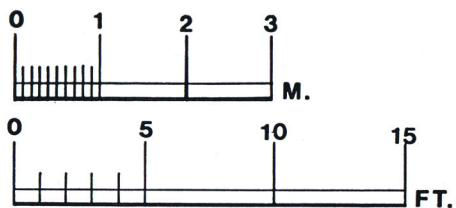
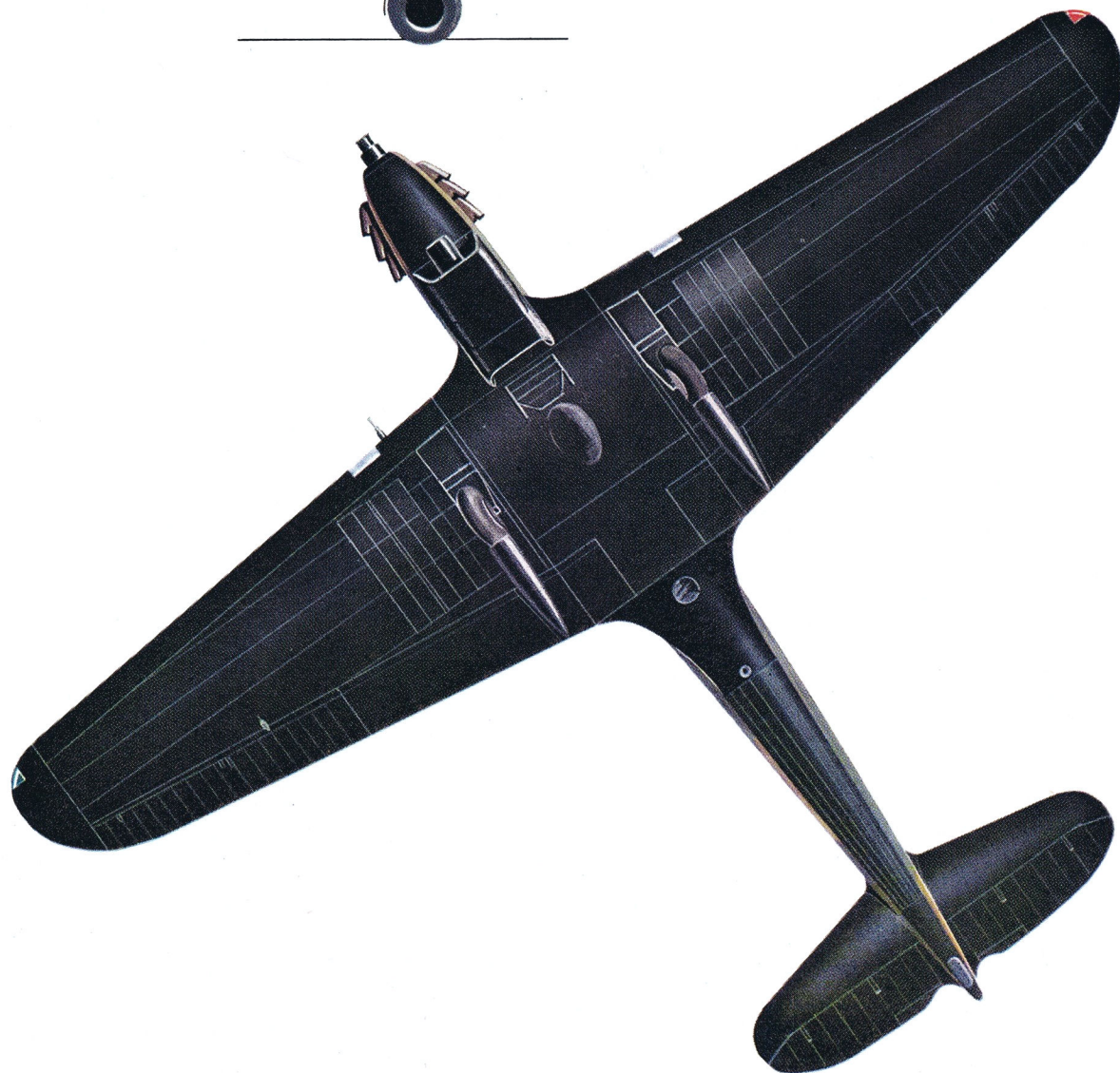
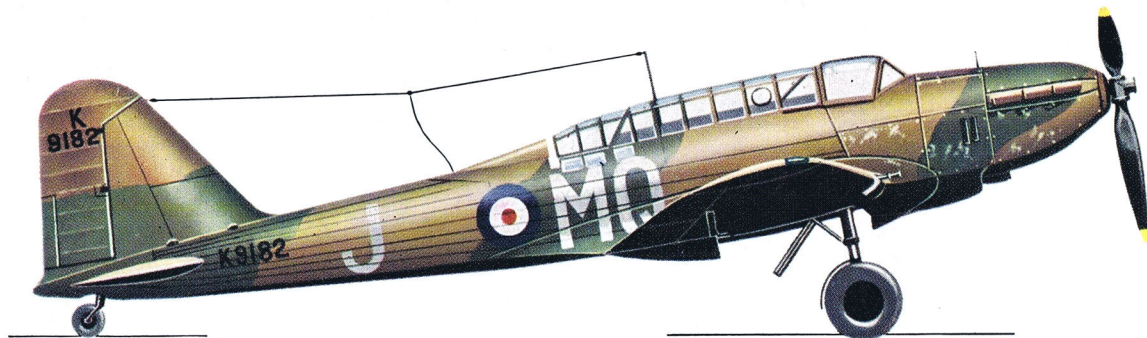
Another snow scene in France. 12 Squadron Battle, L4952 'PH-X' stands by. [Imperial War Museum.





Fairey Battle, K9182, of No. 226 (B) Squadron. Based at Rheims, France, from September 1939 until May 1940, No. 226 Squadron was part of the Advanced Air Striking Force. The aircraft illustrated is typical of the hard-worked Battles that bore the brunt of the attacks on the advancing German forces in France and Belgium.





but he continued to do his job. Soon after crossing the French frontier the engine failed but the Battle regained its base and Macdonald made a forced-landing. The aircraft spun round on the damaged undercarriage after touching the ground, somersaulted on to one wing and caught fire. The pilot was flung out, dazed but not badly hurt. The navigator was jammed inside the fuselage but the air-gunner hauled him out and beat out the flames from his blazing flying-jacket with his bare hands.

After this, daylight reconnaissance missions were suspended. At the same time efforts were made to mount a 'free' gun underneath the Battle to eliminate a dangerous blind spot, but though various mountings were tried none proved entirely satisfactory, so the Battle remained extremely vulnerable to attack from below and astern. One of the experimental ventral gun installations was that produced by No. 12 Squadron—actually a few days before No. 150 Squadron's tragic encounter. 'This', wrote a No. 12 Squadron historian twenty years afterwards, 'was not awfully successful, as the observer had to stand with his back to the gun, and fire it by bending down and aiming between his legs!'

Training flights and exercises now became the general routine for the Battle force, and various dive-bombing and fighter-evasion tactics were tried. However, the ever-necessary 'stand-by's' reduced flying, as did the weather, which, as the weeks went by, eventually became the coldest winter in France for years. In the absence of real bombing the Battles flew over and bombed the practice range at Moronvilliers, which was situated on a desolate tract of hilly country behind the Maginot Line, where there were acres of trenches and rusting wire and waterlogged shell-holes from the Great War. Two of the squadrons (Nos. 15 and 40) returned to the U.K. in December to rearm with Blenheims. In January the airfield at St. Laurent la Salanque (Perpignan), near the Spanish border, became available as a practice camp from which training flights for air gunnery over the sea could be flown. In March came the thaw—and mud. And also the start of a new series of operations in the form of short-range reconnaissance-cum-leaflet raids to ease the strain on the heavy bombers of Bomber Command at home.

At dawn on May 10 came the German assault, and the 'phoney' war was over. From Headquarters, British Air Forces in France, the following message was quickly relayed to the squadrons: 'Belgium and Holland have been violated. Belgium has requested assistance from the Allies. Permission has been given for fighters to fly over the Low Countries, also recon-

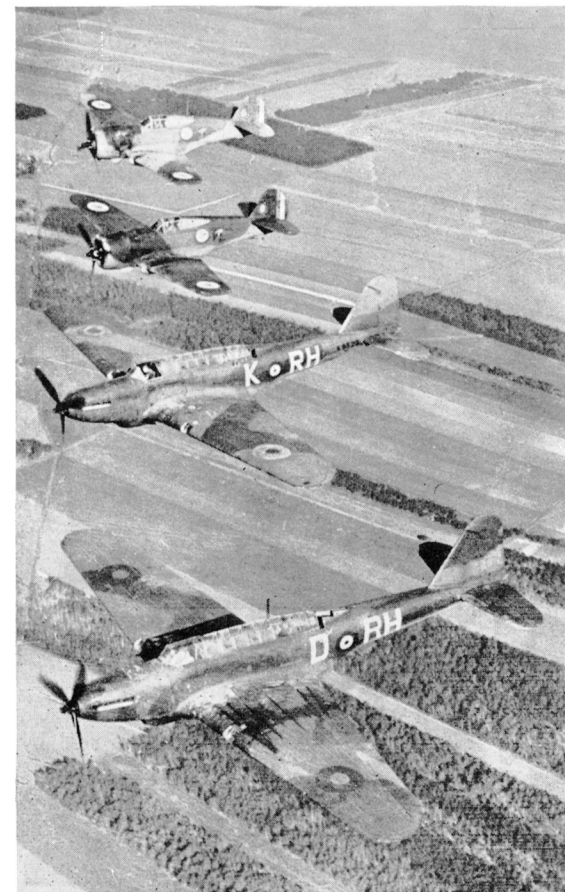
naissance aircraft. But not bombers. Bombers are to stand by.' For the squadrons there followed an agonising wait. While the German columns poured through Holland and Luxembourg, and the *Luftwaffe* bombed and strafed targets in France, all Allied bombers were grounded on the orders of General Gamelin, who clung with supreme obstinacy to the hope that a 'bombing war' would somehow be avoided. At midday the C-in-C. B.A.F.F., Air Marshal 'Ugly' Barratt, took matters into his own hands and ordered the C-in-C., A.A.S.F., to despatch the first wave of Battles. Their target was a column of German troops reported by a French reconnaissance aircraft some hours earlier as advancing through Luxembourg. As it was impossible to provide the Battles with a close fighter escort, the pilots were told to make a very low approach to the target, and to attack at 250 ft., using bombs fused for eleven seconds' delay. The orders were carried out, but the bombers encountered a storm of machine-gun and small-arms fire, and three of the first eight crews were at once shot down. A similar fate overtook their comrades who attacked during the afternoon. Of the thirty-two Battles despatched that day, thirteen were lost and all the rest damaged—a severe price for operations whose effect on the enemy was negligible. On the following day, eight Battles of 88 and 218 Squadrons were despatched on a similar mission. Whether they managed to reach their target area is doubtful. The only pilot to return saw three of his companions succumb to ground-fire in the Ardennes.

On May 12 an attempt was made to stem the German advance towards Brussels by bombing two road-bridges over the Albert Canal near Maastricht. Previous attempts by Allied bombers (including a raid by nine Belgian Air Force Battles on the 11th which cost them six of their number) had failed to destroy the bridges so it now became the turn of the A.A.S.F.'s Battles. Such was the importance of the bridges to the enemy that they had to be destroyed at all costs. Since the ever-increasing strength of the German defences made any further attempt against the bridges almost suicidal, it was decided to despatch six Battles manned by volunteer crews. No. 12 Squadron—the 'Dirty Dozen'—based at Amifontaine, near Rheims, was chosen for the task and every air-crew member immediately volunteered. It was decided that the six crews next on the duty roster should go in two sections of three, led by F/O D. E. Garland and F/O N. M. Thomas, the first to attack the metal bridge at Veldwezelt, the latter section the concrete bridge at Vroenhoven. One crew of Thomas's section failed to take off after finding two aircraft unserviceable.

Garland planned to make a low-level attack while Thomas decided on a high level. Thomas and P/O T. D. H. Davy ran into enemy fighters, dived from 6,000 ft. through a storm of flak and nearly blew themselves up with the last of their bombs. The battered machines failed to stay in the air. Thomas came down, as his engine failed, and was taken prisoner. Davy ordered his crew to bale out and succeeded in coaxing his riddled machine almost back to base before it crashed. Between them, these two pilots slightly damaged the bridge and cratered the approaches.

In the attack on the metal bridge, Garland's section went in at low level, in line astern formation, below the

Battles of 88 Squadron with Curtiss Hawks of the Armée de l'Air over the Western Front in 1940 during the 'phoney war'. [Imperial War Museum.]





Trainee bomb-aimer at the bomb-sight in a Battle (T).

cloud base at 1,000 ft., encountering a growing volume of flak as they did so. P/O I. A. McIntosh, with flames pouring from his machine, jettisoned his bombs and crashed, he and his crew being taken prisoner soon afterwards while hiding in a ditch. 'You British', said their German captors, 'are mad. We capture the bridge early Friday morning. You give us all Friday and Saturday to get our flak guns up in circles all around the bridge, and then on Sunday, when all is ready, you come along with three aircraft and try and blow the thing up.' But even as he spoke, the western truss of the bridge hung shattered in the air, while two other aircraft lay broken and burning on the ground nearby. Either Garland or his No. 3, Sgt Marland—and all the available scraps of evidence indicate that it was Garland—had seriously damaged the bridge. One of these two aircraft (believed to have been Marland's) had been seen momentarily, just before, trying to fight its way out; it suddenly stood on its tail, climbed vertically for 100 ft., stalled, and nose-dived to earth.

For their valour in ensuring success even at the sacrifice of their lives, Garland and his observer, Sgt. T. Gray, were posthumously awarded the Victoria Cross—the first to be won by the R.A.F. in World War II.

On May 10 the A.A.S.F. had 135 serviceable bombers—Battles and Blenheims—on strength, but by the close of May 12 this number had dwindled to seventy-two. The following day the Battles were despatched on only one small operation, during which No. 226 Squadron (Rheims Champagne) hampered the enemy's advance by bringing a factory down over a cross-roads near Breda.

In the early morning of May 14 ten Battles of 103 and 150 Squadrons attacked German pontoon bridges in the Sedan area, and, furthermore, did so without loss—for no enemy fighters were encountered and the tactical low approach had now been abandoned. In the afternoon the entire available force of A.A.S.F. bombers was flung in against the Sedan bridgehead, but this time things were very different: The Bf. 109s were now on guard. 12 Squadron lost four aircraft out of five; 142 Squadron, four out of eight; 226 Squadron, three out of six; 105 Squadron, six out of eleven; 150 Squadron, four out of six; 88 Squadron, one out of ten; 103 Squadron, three out of eight; and 218 Squadron, ten out of eleven. In all, from the sixty-three Battles which took off, thirty-five did not return. To these losses were added five out of eight Blenheims of 114 and 139 Squadrons which also took part in the attack. This brought the total losses in the raid to forty bombers out of seventy-one. No higher rate of loss in an operation of comparable size has ever been experienced by the R.A.F.

This suicidal effort, and another by Blenheims the same evening, were not without effect on the enemy, but even so it only delayed the breakthrough at Sedan by a few hours. With its bases astride the Aisne under increasing threat by the enemy's advance, the A.A.S.F.

withdrew south during the next two days to a number of airfields around Troyes. As it did so, unserviceable aircraft were destroyed to prevent their capture by the Germans. No. 76 Wing alone burned sixteen machines before moving. To improve the mobility of the A.A.S.F. at this time, two of its Battle squadrons, Nos. 105 and 218, which had but four aircraft left between them, were 'rolled up' and their machines and surviving crews transferred to other Battle squadrons. Likewise the two Blenheim squadrons (Nos. 114 and 139), with nine aircraft between them, joined the reconnaissance element of the Air Component of the British Expeditionary Force. Thus reduced, the A.A.S.F. continued the fight at a strength of six Battle and three Hurricane squadrons.

The force carried out three further withdrawals during the remaining weeks of the campaign and finally escaped from the west coast. During this period

A Battle of an unidentified A.A.S.F. squadron being manoeuvred into position ready for take-off on a night reconnaissance sortie during the extra-severe winter of 1939-40. This picture was taken about early February 1940 on a night when the temperature registered 42.50 degrees of frost—the coldest spell so far known by our airmen in France. To enable them to carry on with their work in such conditions the men were issued with rations of rum. [Imperial War Museum.



the Battles continued their task of delaying the enemy's advance but they now operated mainly by night, and with few losses. To quote the R.A.F. Short Official History:

'Flying and landing a Battle by night was no easy task—there was a brilliant glare from the exhaust which dazzled the pilot, and the view from the observer's seat was poor—but those difficulties which were not overcome were ignored, and there was an immediate and dramatic decline in the casualty rate. During the intense daylight operations of May 10–14, one aircraft had been lost in every two sorties; during the night operations of May 20–June 4 the loss was just over one in every two hundred. . . . [Night bombing] however was by no means all gain, for safety could only be achieved at the expense of accuracy. In fact so many Battle crews now dropped their bombs with no more precise identifications of their target than that provided by their watches, that Barratt was compelled to forbid bombing on "estimated time of arrival". After that the phrase ceased to appear in the pilots' reports. The practice, however, continued.'

In the final stage of the campaign the Battles attacked troop movements by day and communications by night.

In the brief lull before the Germans launched their drive southwards on June 5 the main body of the A.A.S.F. was withdrawn from the South Champagne to the region round Orleans and Le Mans. From this central position and from the refuelling bases retained in the South Champagne, the bombers were well placed to intervene along the whole line of battle, and this they did, attacking troop movements by day and communications by night. When on June 11 the enemy broke through the French positions on the Marne, Oise, and Seine—the last line on which any hope of successful resistance could be built—every unit was endangered. The situation rapidly deteriorated during the next few days, and rather than risk the remnants of the Battle force being destroyed on the ground, Barratt ordered them back to England.

No. 1 Group was now re-formed and equipped with Battles once again. From August onwards the squadrons of the Group operated by night mainly from Newton (Notts.) and northern airfields against Dutch and French ports in which Hitler was massing his invasion craft for Operation *Sea Lion*—the projected invasion of Britain. The raids were undoubtedly successful. The crews were greatly helped by the fact that most of the approach to the targets could be made in safety over the sea and the targets themselves were

fairly easily distinguished. Two recently formed Polish Battle squadrons—Nos. 300 and 301, both based at Swinderby (Lincs.)—shared in 1 Group's night offensive from mid-September, and an armourer-fitter of one of these, L.A.C. S. Nowak, earned the first Polish decoration to be awarded in Great Britain to a Pole. While a large parachute flare was being put in on a bombed-up aircraft ready for flight, the striker of its detonator was inadvertently activated. Nowak, immediately realising the danger to the bomber and the ground-crew working on it, pulled the flare off its mounting and ran some fifteen or sixteen yards before it exploded. He was badly burned but saved the bomber and the ground-crew.

Active operations by 1 Group's Battles finally ended on October 15–16 1940, when 301 Squadron bombed Boulogne and 12 and 142 Squadrons bombed Calais. Thereafter the Group completed the task of converting to Wellington aircraft.

Not all the Battle units flew bombing missions following their withdrawal from France. When 88 and 226 Squadrons had remustered they took their new Battles to Sydenham (Belfast), and were engaged until 1941 in patrolling the coast of Northern Ireland to prevent enemy agents being landed from U-boats. Another ex-A.A.S.F. unit (98 Squadron, which had served as a reserve squadron whilst in France) was

posted in July 1940 to Iceland, where it subsequently saw almost a year of active service with Coastal Command.

In addition to being used for operational duties the Battle was used for air-crew training purposes, special variants being produced for pilot training and bombing and gunnery training. It not only flew with the R.A.F. in these roles, but also with the R.C.A.F., the R.A.A.F. and the S.A.A.F. However, all this is another story.

Specification

Battle III: *Crew 3; power plant* Rolls-Royce Merlin III, 1,035 h.p. at take-off; *span* 54 ft.; *length* 42 ft. 1 $\frac{3}{4}$ in.; *wing area* 422 sq. ft; *empty weight* 6,647 lb.; *loaded weight* 10,792 lb.; *bomb load* 1,000 lb. normal, 1,250 lb. max.; *max. speed* 210 m.p.h. at sea-level, 257 m.p.h. at 20,000 ft.; *service ceiling* 25,000 ft.; *range* 1,050 miles with 1,000 lb. bomb load; *armament* one .303 in. Vickers (or Browning) m.g. in starboard wing (436 rounds), one .303 in Lewis (or Vickers) free-mounted m.g. in dorsal position (one ventral m.g. fitted later).

F/O Norman Thomas's Battle III P2332 PH-F of 'A' Flight, 12 Squadron, shot down by German flak during the famous raid on the Maastricht bridges, 12 May 1940.

